2016

Sedge meadow response to various experimental treatments

Mitchell Austin Baalman
Iowa State University

Sedge meadow response to various experimental treatments

by

Mitchell Austin Baalman

A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Environmental Science

Program of Study Committee:
Arnold van der Valk, Major Professor
Thomas Jurik
Brian Hornbuckle

Iowa State University

Ames, Iowa

2016

TABLE OF CONTENTS

ACKNOWLEDGEMENTS iv

ABSTRACT v

CHAPTER I: GENERAL INTRODUCTION 1
Background 1
Thesis Organization 1
Research Funding 2

CHAPTER II: EFFECT OF STRATIFICATION, GROUNDWATER LEVEL, SEEDING DENSITY, AND THE SPLIT SEEDING OF AGGRESSIVE SPECIES ON SEDGE MEADOW RESPONSE 3
Abstract 3
Introduction 3
Methods 5
Location and Study Area 5
Mesocosms 5
Irrigation System 6
Seeds and Seeding Time 6
Treatments and Experimental Layout 7
Plan of Analysis 8
Results 8
Year 1 (2014) 8
Year 2 (2015) 12
Year 3 (2016) 18
Comparison Among Years 23
Diversity 26
Biomass 27
Soil Temperatures 32
Discussion 32
Year 1 (2014) 32
Year 2 (2015) 34
Year 3 (2016) 37
Biomass 40
Soil Temperature 41
Conclusions 41

CHAPTER III: EFFECT OF SMALL SCALE DIFFERENCES IN GROUNDWATER LEVEL ON SEDGE MEADOW RESPONSE 43
Abstract 43
Introduction 43
Methods 44
Location and Study Area 44
Water-control System 44
Mesocosms 45
Seeds 45
Treatments 46
Measurements 46
Analysis 47

Results 47
Soil Moisture and Temperature 47
Plant density 47
Diversity 49
Discussion 50
Soil Moisture and Temperature 50
Plant density 50
Diversity 52
Conclusions 53

REFERENCES 54

APPENDIX A: PROCEDURE FOR FIRST STUDY 56

APPENDIX B: ANOVA TABLES 60
Study One 60
Year 1 (2014) 60
Year 2 (2015) 67
Year 3 (2016) 76
Biomass 85
Study Two 95

APPENDIX C: RAW DATA 104
Study One 105
Count Data 105
Biomass Data 131
Study Two 133
Count Data 133

APPENDIX D: DIAGRAMS 137

ACKNOWLEDGEMENTS

I would like to first thank my major professor, Dr. Arnold van der Valk. His subtle guidance has allowed me to thoroughly learn through my successes and failures as a graduate student. Secondly, I would like to thank my very enthusiastic undergraduate worker Alex Andera. His witty commentary and insightful ideas helped keep the fun in counting thousands of plants. I would also like to thank my program of study committee, Dr. Brian Hornbuckle and Dr. Thomas Jurik, for their direction and prudence. Lastly, I cannot forget my friends in Ames, especially Olga Miočević, for their relentless encouragement.

ABSTRACT

Plant density, species diversity, and the biomass of sedge meadow species were measured in mesocosms treated with one of two levels of four treatments in a randomized block experiment: stratified or not stratified seed, high or low groundwater level, high or low seeding density, and a complete set of all species or a split-set where non-aggressive species were seeded in the spring and aggressive species were seeded the following fall. The study was conducted at Iowa State University's Hinds Research Farm in Ames, IA from 2013-2016. The high groundwater level had the greatest impact on increasing the plant density, diversity, and biomass of sedge meadow species. Stratifying seed also had a significant impact, but to a lesser extent. Seed density was found to have no effect on sedge meadow species response. The split-set of seeded species increased the plant density and biomass of many non-aggressive sedge species, but only a few grasses or forbs. The split-set also significantly reduced the number of aggressive species present at the end of three years.

In a follow-up study from 2015-2016 at the same research site, plant density and species diversity of sedge meadow species were measured in mesocosms treated with varying fine-scale groundwater levels and seeding dates. The groundwater levels were 0, 5, 10, and 20 cm measured below soil surface. The seeding dates were June 16, June 30, and July 14, 2016. The plant density of forb species increased by 0.6 plants/ 0.4 m^2 soil surface / cm decrease in groundwater level ($p < 0.001$). The seeding date of June 30 resulted in the highest average plant density of forbs at 6.9 per m^2 soil surface ($p < 0.05$). S. tabernaemontani decreased at the rate of -0.1 plants/ 0.4 m^2 soil surface/ cm decrease in groundwater level ($p < 0.001$). High numbers of S. tabernaemontani corresponded with decreased plant density of other species and decreased diversity.

CHAPTER I: GENERAL INTRODUCTION

Background

It is now well known that the massive reduction in wetlands since the advent of modern agriculture has been a leading factor in the loss of biodiversity in the Midwest, USA and elsewhere. These wetlands provided crucial habitat for wildlife, filtered nutrients, and even helped control flooding. Though there have been major efforts to restore wetlands, most of these restoration projects try to establish deep-water marshes that do not reflect the historical diversity of wetlands in the landscape (Galatowitsch and van der Valk, 1996). In restored wetlands, an often overlooked community is the sedge meadow zone. The sedge meadow zone, which is at the periphery of most wetlands, is characterized by dense vegetation consisting of perennial sedges, grasses, and forbs on saturated soil (Eggers and Reed, 1997).

In the Midwest, natural sedge meadow communities in wetland areas typically maintain themselves by vegetative or asexual growth. Studies of seed banks in these communities indicate that very small numbers of *Carex* seeds and other sedge meadow species are present (van der Valk and Davis 1978). Thus, it is unlikely that sedge meadows can be re-established from seed banks in restored wetlands. Consequently, sedge meadows will need to be re-established by seed. However, efforts to do so have often been unsuccessful (Bremholm, 1993). A study by Galatowitsch and van der Valk (1996) comparing restored wetlands to natural wetlands in the glaciated mid-continent of the United States, found that restored wetlands had significantly fewer sedge meadow species. The following studies will address these problems by testing several treatments that may increase the success of sedge meadow restorations by seed.

Thesis Organization

Chapter 1 is an introduction to the restoration of sedge meadow communities. It presents a few of the current challenges related to sedge meadows and why we need to address them. Chapter 2 is a study evaluating the effect of several treatments that effect sedge meadow restoration success. These treatments are groundwater level, seed stratification, seeding density, and the split planting of aggressive and non-aggressive species. Chapter 2 also includes an introduction discussing those treatments in the literature. Chapter 3 presents a follow-up study. The first study in Chapter 2 showed promising results for the groundwater treatment, so the second study was a more in-depth evaluation of the effect of groundwater level on sedge meadow response. References for all chapters are presented following Chapter 3. Appendix A gives a more detailed procedure for the methods of Chapter 2. Appendix B gives the ANOVA tables for both studies. Appendix C gives the raw data for both studies. Finally, Appendix D gives a few diagrams and pictures of the experimental layout of the second study in Chapter 3.

Research Funding

This research was funded by a grant from the Environmental Protection Agency (Grant ID: CD – 97737801-0). The goals of this grant were to develop guidelines of establishing diverse sedge meadow communities and to share this information through workshops and presentations. A sedge meadow workshop discussing the results of this research, as well as the current state of wetlands, was held in June 2016 in Ames, IA, USA.

CHAPTER II: EFFECT OF STRATIFICATION, GROUNDWATER LEVEL, SEEDING DENSITY, AND THE SPLIT SEEDING OF AGGRESSIVE SPECIES ON SEDGE MEADOW RESPONSE

Mitchell A Baalman

Abstract

Plant density, species diversity, and the biomass of sedge meadow species were measured in mesocosms treated with one of two levels of four treatments in a randomized block experiment: stratified or not stratified seed, high or low groundwater level, high or low seeding density, and a complete set of all species or a split-set where non-aggressive species were seeded in the spring and aggressive species were seeded the following fall. The study was conducted at Iowa State University's Hinds Research Farm in Ames, IA from 2013-2016. The high groundwater level had the greatest impact on increasing the plant density, diversity, and biomass of sedge meadow species. Stratifying seed also had a significant impact, but to a lesser extent. Seed density was found to have no effect on sedge meadow species response. The split-set of seeded species increased the plant density and biomass of many non-aggressive sedge species, but only a few grasses or forbs. The split-set also significantly reduced the number of aggressive species present at the end of three years.

Introduction

Several studies have addressed the problem of restoring sedge meadow communities by evaluating different factors or variables influencing germination and establishment. For example, van der Valk et al. (1999) assessed the effects of seed age, storage conditions, soil moisture, and soil amendments on seed viability, germination, and growth. They found that the probability of establishing sedge meadow species was increased using fresh seed, raising soil organic matter content, and by increasing soil moisture levels. Schultz and Rave (1999) found that 28 of the 32 species of sedges used in the experiment had increased germination rates when stratified under cold-wet conditions. Stratification is the process of exposing seeds to cold-wet conditions to break seed dormancy.

Our research built on these previous studies and looked further into some of the factors influencing the establishment of sedge meadow species from seed. One experiment, which will be the focus of Part I of this thesis, examines the effect of seed stratification, seed density, the timing of aggressive species introduction, and the height of the groundwater level on plant density and species diversity. We chose to examine these variables for different reasons. First, as mentioned earlier, both cold-wet stratification and high soil moisture content have been shown to increase germination in restoration projects, so it is important to continue to experiment with these variables to extend earlier findings. Secondly, we chose to look at planting densities because, though some studies (Budelsky and Galatowitsch, 2000) have looked at seedling planting densities (i.e., plants already germinated before planting) in sedges, the effect of changing seed densities specifically during planting is not well known. We also chose to look at how delaying the planting of aggressive species affects species responses to see if it would give non-aggressive species a chance to become established before a dominant species could take over. Lastly, we chose to experiment with different groundwater levels. Many studies on different plant communities (Gowing et al., 2002; Silverton et al., 1999), as well as studies on sedge meadows (van der Valk et al., 1999; Budelsky and Galatowitsch, 2000), have shown that soil moisture and water levels play a very important role in establishment and community structure.

A complete, randomized block experiment was conducted using outdoor mesocosms and characteristic sedge meadow plant species, which are listed later in this paper. We chose to use an outdoor mesocosm approach because it helps isolate specific variables, and it also makes it possible to have a high number of replicates (Fraser and Keddy, 1997). The use of large outdoor mesocosms also provides for a more practical approach as opposed to a greenhouse experiment because it provides a space that is exposed to natural environmental conditions typical of local wetland areas. The four treatments we examined are stratification, groundwater level, seeding density, and the split seeding of aggressive and non-aggressive species. The split seeding means that non-aggressive species are seeded in the spring and aggressive species are seeded in following fall.

Using the previous research cited above as background, there are two key hypotheses for this experiment. First, it is hypothesized that there is a positive relationship between plant density and biomass and the treatments of stratification, high seed density, and high groundwater level. This is hypothesized because 1) stratification is often required for seed germination, as shown in studies cited previously, 2) higher planting densities results in higher establishment in previous studies such as the one cited earlier, and 3) a higher groundwater level will assure that seeds are not water-limited and therefore prevented from germinating. The second hypothesis is that stratification, high groundwater level, the split planting of aggressive and non-aggressive species, and high seed density causes an increase in species diversity. This may occur because stratification of seed has been shown to promote germination in a higher proportion of species. Secondly, a high groundwater level means that water will not be a limiting requirement in a greater proportion of the seeded species. The split seeding of aggressive species gives non-aggressive species a chance to establish before dominant species can take over. This gives a competitive advantage to non-aggressive species. Lastly, a higher seed density means that species with low success in establishment have a higher chance of having at least one plant become established.

Methods

Location and Study Area

This experiment was conducted at Iowa State University's Hinds Research Farm, just North of Ames, IA, and adjacent to the Skunk River. The Hinds Research Farm is used primarily for research purposes and provides easy access to well-water. The experimental site was leveled prior to the construction of the mesocosm complex to reduce variability and to make it easier to maintain accurate water levels. The research location exposed the mesocosms to natural weather conditions. The first planting of the experiment began in May of 2014. The experiment was conducted until the end of the 2016 growing season, when the plants were harvested. See Appendix A for detailed procedure of methods.

Mesocosms

The mesocosms were large oblong, polypropylene tubs that housed the soil medium on which the seeds were planted. Each of the 80 mesocosms was $^{2}/_{3}$ m deep and had one square meter of surface area at the top. Each mesocosm was filled with 10 cm of gravel to allow for even dispersion of water entering the bottom. On top of the gravel, each mesocosm was filled with wetland soil. This soil was excavated from a wetland in northern Iowa. Finally, there were small holes drilled into each mesocosm depending on its assigned groundwater level. For instance, if it was designated as a high groundwater level mesocosm, then we drilled holes about 5 cm below the soil surface. For low groundwater level mesocosms, we drilled holes at 30 cm below the soil surface.

Irrigation System

To maintain desired groundwater levels, we constructed an irrigation system. Each mesocosm had a hole drilled in it as close as possible to the bottom. From that hole, we connected a pipe that led to one of two main lines. Each main line corresponded to either a high or low groundwater level. In other words, each mesocosm that was assigned a high groundwater level was connected via one main line, and the low groundwater level mesocosms were connected via the other main line. The two main lines were then connected to a large water reservoir tank.

The actual act of watering the mesocosm complex can be described as a pulse-feed system. Every day, a valve at the base of the reservoir tank was manually opened, allowing water to gravity feed into the mesocosms. Once the water began draining out of the holes drilled into the sides of the mesocosms, a valve for each main line was closed. This created a groundwater level in each mesocosm at the height of the drilled holes. We refer to this as a pulse-feed system because watering only takes place once per day, after which the water level slowly begins to drop due to evapotranspiration.

Seeds and Seeding Time

The species used in this study are a selection of sedge meadow species, including grasses, sedges, and forbs that would be typical for a wetland in the area. The species planted were *Calamagrostis canadensis, Glyceria striata*, Leersia oryzoides*, Sparganium eurycarpum*, Eleocharis palustris*, Juncus dudleyi, Scirpus tabernaemontani*, Asclepias incarnata, Aster puniceus, Eupatorium perfoliatum, Helenium autumnale*, Lobelia siphilitica, Scutellaria lateriflora*, Solidago gigantea, Cicuta maculata, Stachys palustris, Thalictrum dasycarpum, Carex cristatella, Carex hystericina, Carex molesta, Carex pellita, Carex stipata, Carex stricta,* *Carex tribuloides*, and *Carex vulpinoidea**. Species marked with an asterisk were considered aggressive species.

Seeds for mesocosms that were designated for stratification were stored in wet sand at a temperature of 4 degrees Celsius for 4 months. Seeds not designated for stratification were dry stored in sand at the same temperature.

The seeds were purchased from Prairie Moon Nursery, a company based in Winona, MN that specializes in native seed production and supply. Each species was equally represented in each mesocosm based on the percent pure live seed rating each sample was given by Prairie Moon Nursery, i.e., each species had approximately the same number of live seeds planted. Before seeding, the soil surface of each mesocosm was gently disturbed to ensure contact of seeds with the soil.

The seeding time of the mesocosms depended on whether the mesocosm was designated as a complete species set (i.e., including all species) or a split-set (i.e., non-aggressive species in one set and aggressive species in a separate set). Therefore, half of the mesocosms were seeded with all species at the end of May 2014. The other half was seeded with the split-set, i.e., only the non-aggressive species at the end of May and the aggressive species at the end of October 2014.

Treatments and Experimental Layout

The experiment used four different treatments and two levels of each of those treatments. The four treatment types were stratification, groundwater level, species-set, and seed density. Because there are two levels for each, the total number of possible combinations was 2^4 or 16. Thus, we used 16 mesocosms for each block and a total of five blocks. Treatment combinations were randomly assigned to mesocosms in each block. This created a complete, randomized block design. The blocks were contiguous.

The seeds were either stratified or not stratified. The seed density was either 840 (high) or 420 (low) seeds per square meter (420 seeds per square meter is the USDA guideline). The species planted either included a complete set of all the species or a split-set, where the non-aggressive species were seeded in May 2014 and the aggressive species were seeded in

November 2014. Finally, the groundwater level was either set to high (5 cm below the surface of the soil) or low (around 30 cm below the surface) to represent two different soil moisture levels.

Plan of Analysis

Plant density, diversity, and plant biomass were calculated for each species and for three groups of species (grasses, sedges, and forbs) to evaluate the four treatments. Species diversity values for each mesocosm were calculated in the form of Simpson's 1/D. Simpson's 1/D is a diversity index that takes into account species richness and evenness. In this index, the larger the number, the more diverse the mesocosm is. Species richness, i.e., the number of species present per m^2 for each treatment was also calculated. Plant density data was measured by counting individual plants every 2 weeks during the growing season. A total of five counts were made during each year. The final count of year 1 (2014) was used for plant density and diversity analysis. The fourth count of year 2 (2015) and year 3 (2016) were used for plant density and diversity analysis (see Appendix C for raw count data). To determine whether a specific treatment had a significant effect on diversity or plant density, we used Analysis of Variance (ANOVA) in R-software program (see Appendix B for all ANOVA tables).

After the third field season (2016), all plants in the mesocosms were cut at the soil surface and the plants were dried and weighed. Each species from each individual mesocosm was sorted into bags and measured (see Appendix C for raw count data). The plants were dried in ovens at 60 degrees Celsius for 24 hours. The biomass data was also compared with ANOVA.

Soil temperatures were measured by placing thermocouples three cm below the soil surface in two high groundwater mesocosms and two low groundwater mesocosms. Soil temperatures were measured over all three years.

Results

Year 1 (2014)

During the first growing season, aggressive species were not yet seeded in mesocosms that were subject to the split-set treatment, so the species-set treatment was not yet relevant. This means that any data concerning the species-set treatment was not relevant during the first growing season.

Because sedges and some grasses were not yet identifiable after one growing season, the data for year one only include generalized groups (sedges, forbs, and grasses). Thus, diversity indices could not be calculated for year one. The final count of the first year, August 15, was used for the analysis. Species were most easily distinguishable on this date.

General

In Year 1, there were apparently large differences between the levels of each treatment in plant density (Figure 1), with all treatments combined. For example, the difference between high and low groundwater level was very large. The same was true for the rest of the treatments. More detailed statistical analyses are presented below. There was an average plant density of 55 plants per mesocosm (m^2), calculated over all treatments. This number changed slightly throughout the years (see below); figures 2, 3, and 4 show the mean plant density for the species groups of forbs, sedges, and grasses.

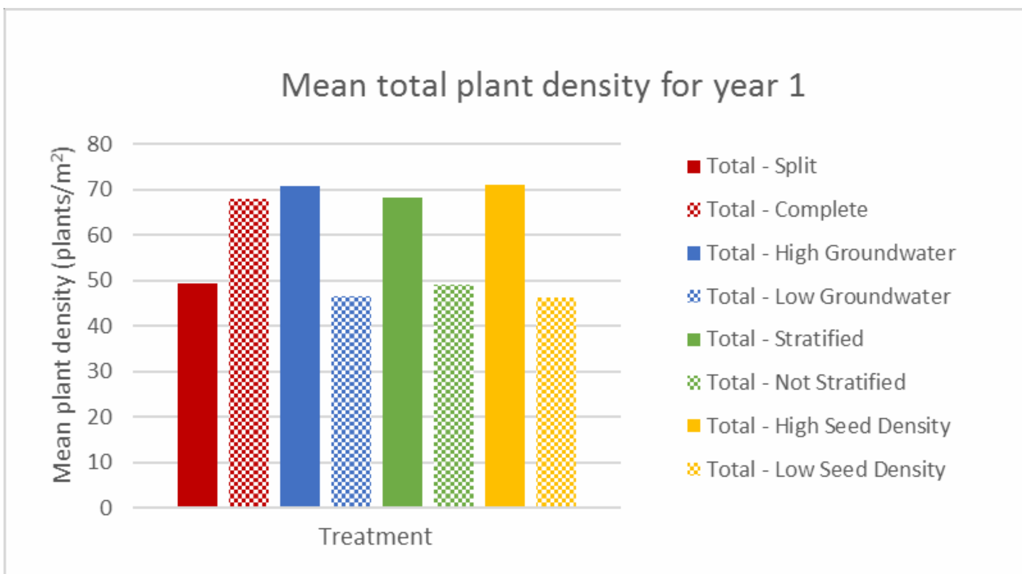

Figure 1. – Mean total plant density (plants/m2) for each treatment in Year 1 (2014).

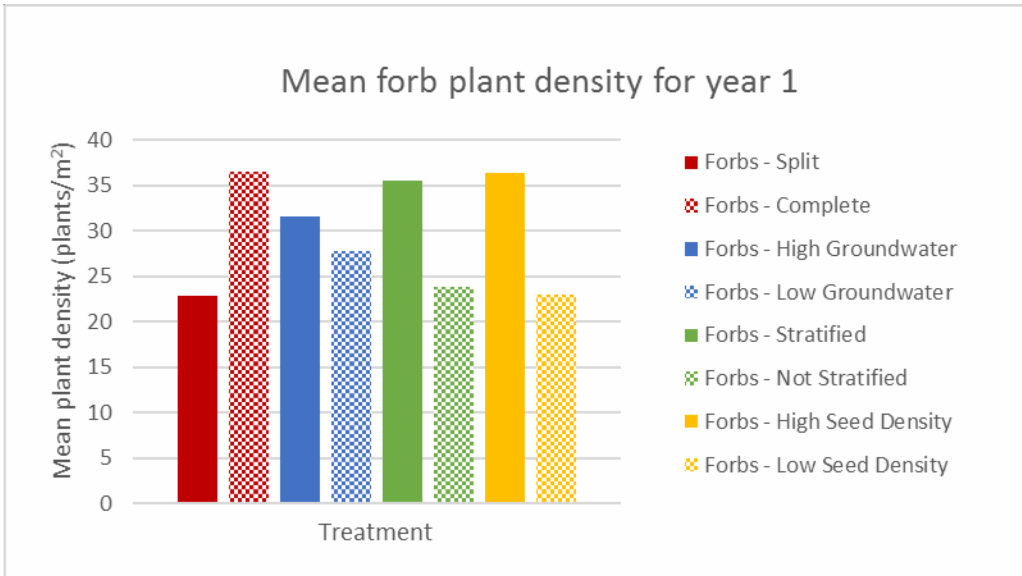

Figure 2. – Mean plant density (plants/m2) of forbs for each treatment in Year 1.

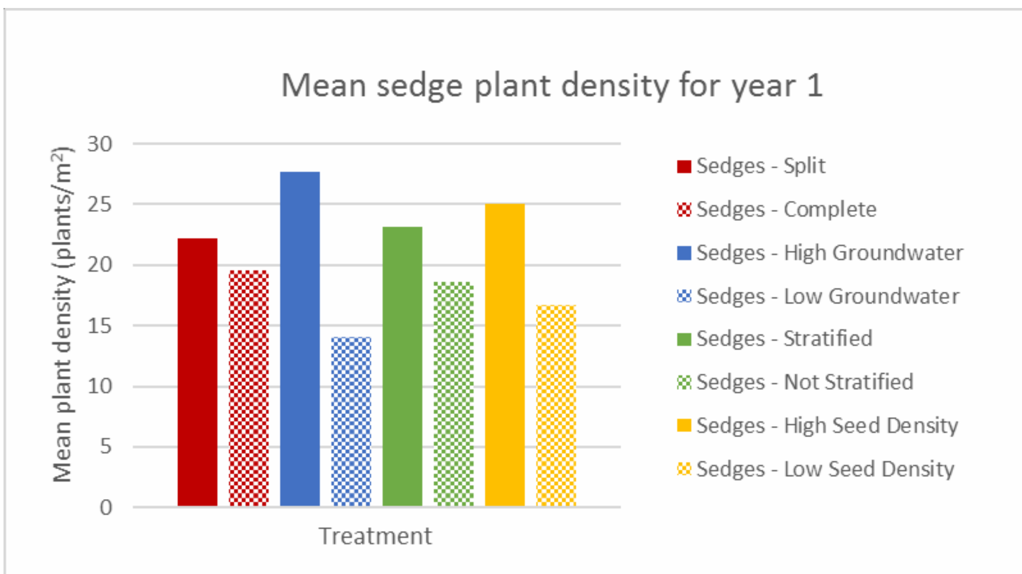

Figure 3. – Mean plant density (plants/m2) of sedges for each treatment in Year 1.

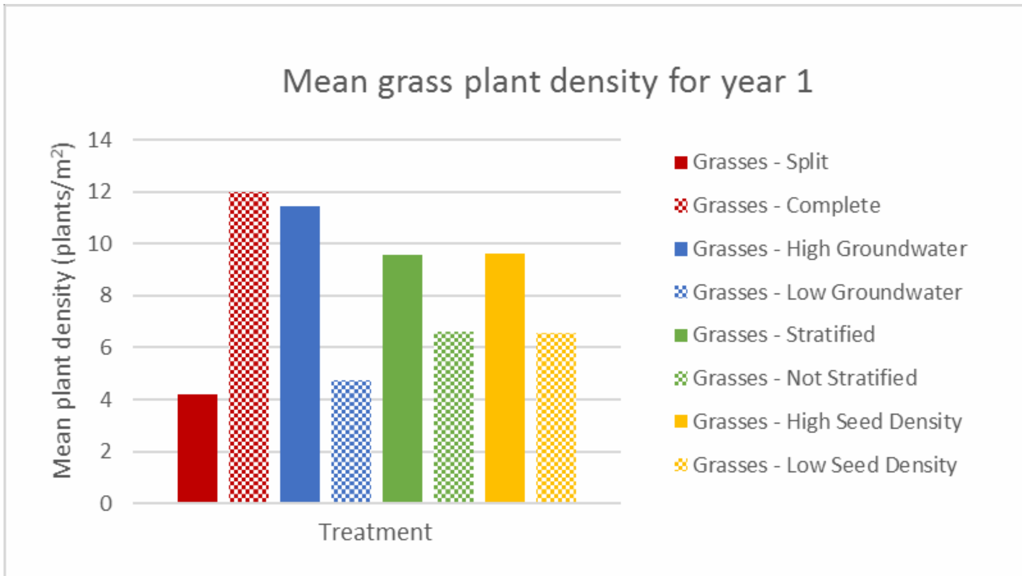

Figure 4. – Mean plant density (plants/m2) of grasses for each treatment in Year 1.

Plant Density

On average, stratification, high groundwater level, and high seed density increased the total plant density in the mesocosms when considered individually (p = <0.001, <0.001, <0.001 respectively; $r^2 = 0.56$). Stratification, high groundwater level, and high seed density all had positive effects on each species group (forbs, sedges, grasses), including the total number of plants (Figure 1). All of these effects were also significant with a p-value less than 0.05, except for the effect of groundwater level on the plant density of forbs. There were no interaction effects.

Table 1. – Summary of the differences in plant density means for the effect of each treatment on the species groups of forbs, sedges, and grasses, as well as the total number of plants. High groundwater level, stratification, and high seeding density are the base levels of comparison. Blue highlighted boxes indicate a significant positive effect (p <0.05).

	Differences in means (plants/m^2)		
Species Type	High groundwater	Stratified	High density
Forbs	3.8	11.8	13.4
Sedges	13.7	4.5	8.4
Grasses	6.7	3.0	3.1
Total number of plants	24.2	19.2	24.8

Year 2 (2015)

General

The differences in mean plant density in year 2 were apparently less pronounced than in year 1. The mean plant density of each mesocosm was about 40 plants. This was less than the first year for two reasons. First, there was counting error. When the plants were very small, it was very easy to count each plant. As the mesocosms became more crowded in Year 2, accurately counting each plant became more difficult. Plants likely were also over-counted in year 1 because it was hard to distinguish one individual from another. Second, many seedlings did not survive the winter after the first year, which decreased plant numbers. Figures 6, 7, and 8 display the mean plant density of each species group in year 2 (2015).

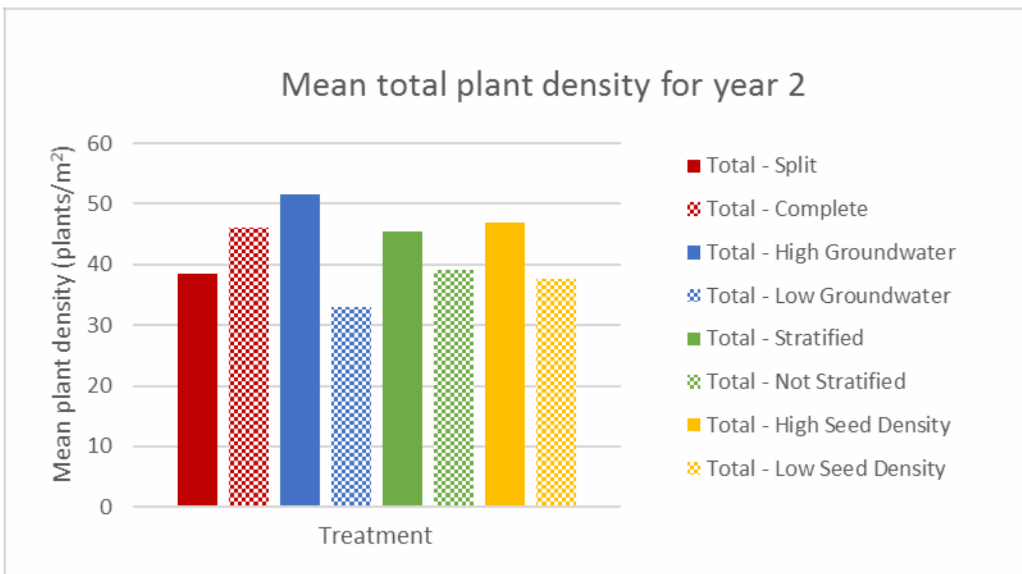

Figure 5. – Mean total plant density (plants/m2) for each treatment in Year 2.

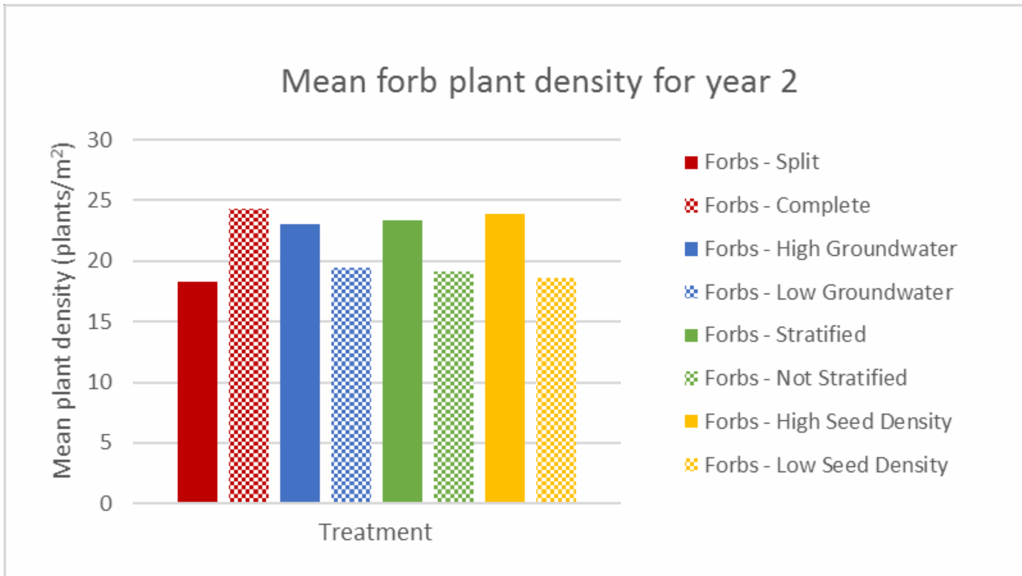

Figure 6. – Mean plant density (plants/m2) of forbs for each treatment in Year 2.

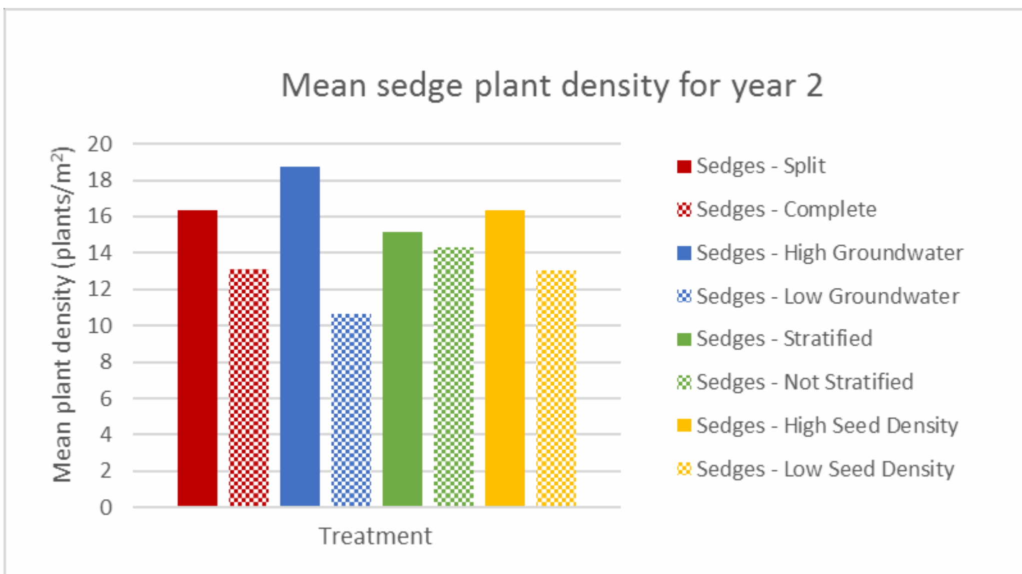

Figure 7. – Mean plant density (plants/m2) of sedges for each treatment in Year 2.

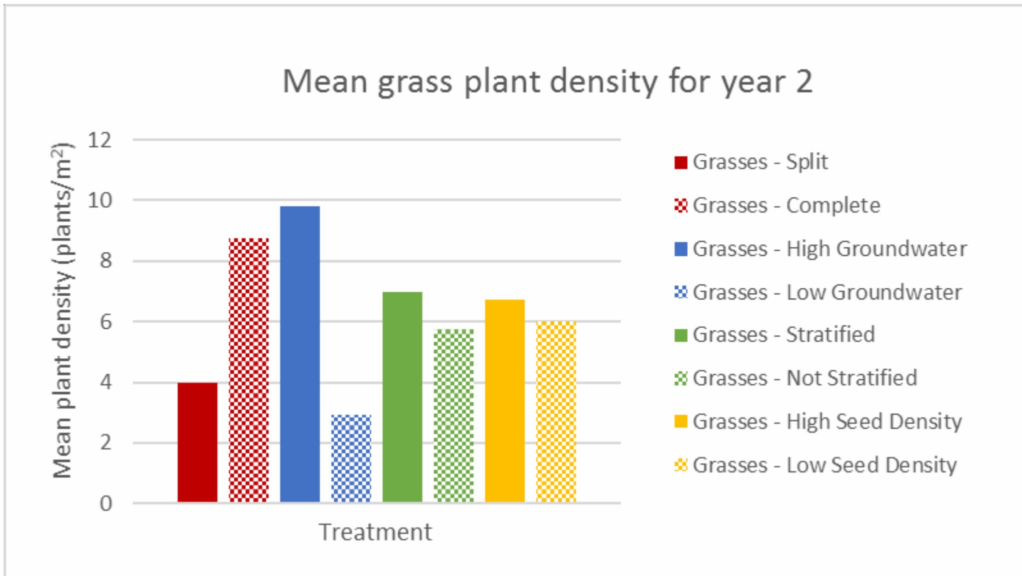

Figure 8. – Mean plant density (plants/m2) of grasses for each treatment in Year 2.

Plant Density

Stratification, high groundwater level, and high seed density increased the total plant density in the mesocosms ($p = 0.027$, <0.001, <0.001 respectively; $r^2 = 0.46$). The split-set treatment decreased the total plant density (aggressive and non-aggressive plants) ($p = 0.008$, $r^2 = 0.46$). High groundwater level had a positive effect on forbs, sedges, and grasses. Stratification only had a positive effect on forbs. High seed density had a positive effect on forbs and sedges. The split-set treatment had a negative effect on the plant density of both forbs and grasses, but it had a positive effect on the plant density of sedges. There were no interaction effects.

Table 2. – Summary of differences in plant density means for the effect of each treatment on the species groups of forbs, sedges, and grasses, as well as the total number of plants. The complete seed set, high groundwater level, stratified seeds, and high seed density are the base levels for comparison. Blue highlighted boxes indicate a significant positive effect ($p < 0.05$). Red highlighted boxes indicate a significant negative effect ($p < 0.05$).

	Differences in means (plants/m^2)			
Species Type	Split-Set	High groundwater	Stratified	High density
Forbs	-6.0	3.6	4.2	5.2
Sedges	3.3	8.1	0.9	3.4
Grasses	-4.8	6.9	1.2	0.7
Total number of plants	-7.6	18.6	6.3	9.3

The effect of the four treatments on plant density was also calculated for all individual species. When stratification, high groundwater level, or high seed density had a significant effect on the average plant density of a species, that effect was generally positive (Table 3). The only species that was significantly, negatively affected by stratification or a high groundwater level was *Solidago gigantea*. The species-set treatment had mixed positive and negative significant effects depending on the species (forb, sedge, or grass) and whether it was an aggressive species.

High groundwater level had a significant positive effect on the plant density of all three groups (Table 1). Stratification and high seed density only had significant positive effects on the plant density of forbs. For plant density of individual species, a high groundwater level had the most significant positive effects (Table 3). There were 10 species that were significantly, positively affected by having a high groundwater level, whereas there were only 5 species that were significantly, positively affected by either stratification or high seed density.

The results are more complex for the species-set treatment (Table 3) when looking at individual species. Of the nine non-aggressive grass and forb species that were present in the mesocosms (excludes those species that did not germinate), only three species showed a significant increase in plant density in the split-set treatment. However, of the five non-aggressive sedge species that germinated, four species showed a significant increase in plant density under the split-set treatment.

Table 3. – Summary of differences in plant density means for individual species in regards to stratification, groundwater level, species set, and seed density. The complete species set, high groundwater level, stratified seed, and high seed density are the base levels for comparison. ANOVA was conducted separately for each species. Blue highlighted boxes indicate a significant positive effect ($p < 0.05$). Red highlighted boxes indicate a significant negative effect ($p < 0.05$). Asterisks denote an aggressive species.

	Differences in Means (plants/m^2)			
Species	Split-set	High groundwater	Stratified	High density
Calamagrostis canadensis	1	0.4	-0.5	-0.1
*Glyceria striata**	-2.0	1.2	-0.3	0
*Leersia oryzoides**	-2.3	1.8	1.0	-0.1
Juncus dudleyi	0	2.2	-0.4	0.3
*Scirpus tabernaemontani**	-1.5	1.4	1.4	0.6
Asclepias incarnata	0.4	0.3	0.8	0.3
Aster puniceus	2.1	0	0	1.0
Eupatorium perfoliatum	0.7	0.6	1.2	1.1
*Helenium autumnale**	-6.8	0	0.7	0.8
Lobelia siphilitica	1.8	1.6	0.2	1.1
Scutellaria lateriflora	0.1	0	0.1	0
*Solidago gigantea**	-5.5	-1.3	-1.3	0.2
Cicuta maculata	1.0	2.0	3.2	0.9
Stachys palustris	0.2	0.5	-0.6	-0.1
Carex cristatella	0.7	0.4	-0.3	0.6
Carex hystericina	0.7	1.0	0.2	0.2
Carex molesta	0.7	1.6	-0.2	0.2
Carex stipata	1.5	2.5	0.9	0.9
Carex tribuloides	2.9	2.1	0.6	0.8
*Carex vulpinoidea**	-3.1	0.5	-0.2	0.7

Diversity

On average, stratification, high groundwater level, and high seed density significantly increased Simpson's index diversity in the mesocosms (Figure 9). Stratifying the seeds increased diversity by 0.99, on average ($p = 0.005$, $r^2 = 0.49$). The high groundwater level treatment increased diversity by 2.32, on average ($p < 0.001$, $r^2 = 0.49$). High seed density increased diversity by 0.88, on average ($p = 0.02$, $r^2 = 0.49$). Delaying the planting of aggressive species resulted in a decrease in diversity of 1.44, on average ($p < 0.001$). Much like the plant density results, the high groundwater level seemed to be the most impactful treatment with regards to diversity. However, it is important to note that stratification and high seed density both contributed to significant increases in diversity. There were no interaction effects.

High groundwater treatment increased species richness by 2.7 species per m^2 ($p<0.001$). The stratified treatment increased richness by 1.1 species per m^2 ($p=0.017$). High seed density increased richness by 0.9 species per m^2 ($p=0.048$). The split-set treatment decreased richness by 2.2 species per m^2 ($p<0.001$).

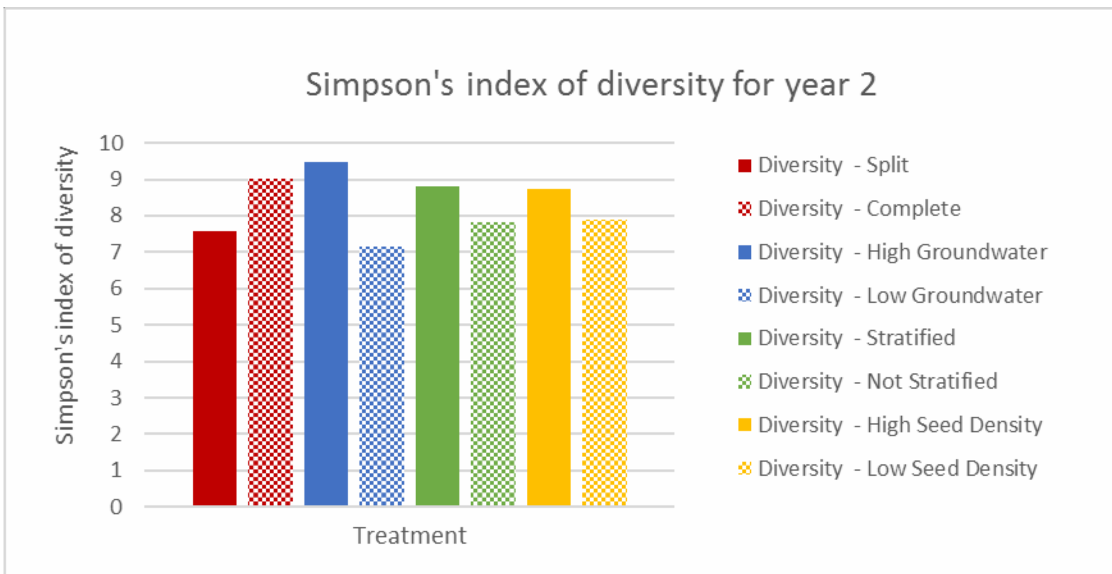

Figure 9. – Mean diversity score (Simpson's index of diversity) for each treatment in Year 2.

Year 3 (2016)

General

The total plant density in each mesocosm in year 3 apparently increased slightly from year 2 (Figure 5). The differences between the levels of the treatments appear to have become larger, though this is not tested. Figures 11, 12, and 13 display the mean plant density of each species group (forbs, sedges, and grasses) for each treatment in year 3.

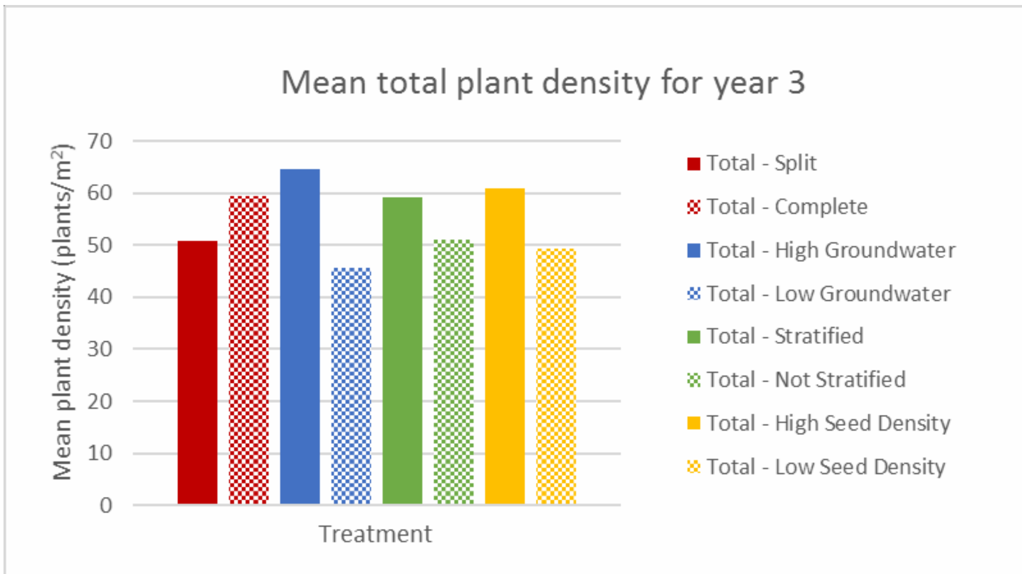

Figure 10. – Mean total plant density (plants/m2) each treatment in Year 3.

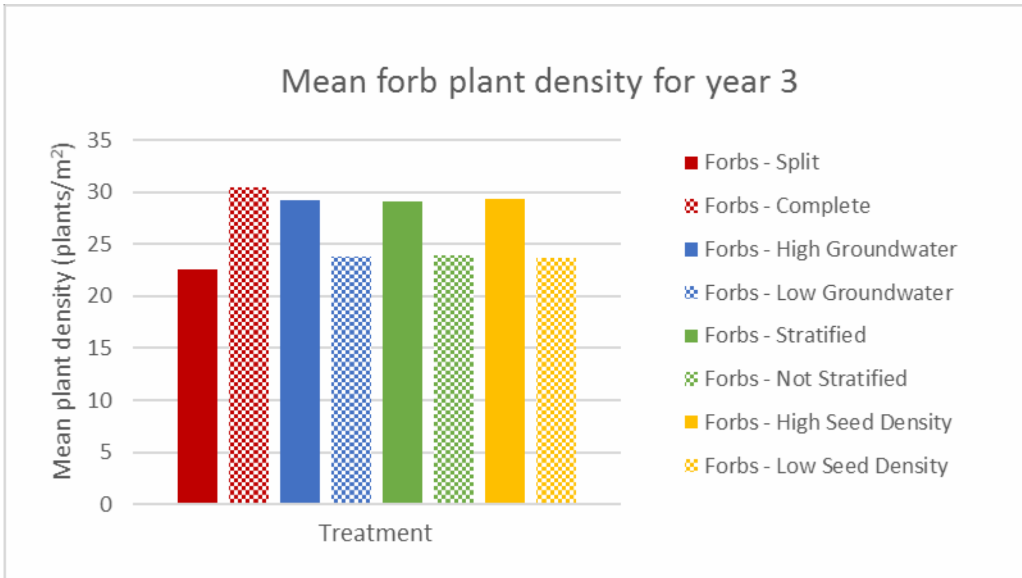

Figure 11. – Mean plant density (plants/m2) of forbs for each treatment in Year 3.

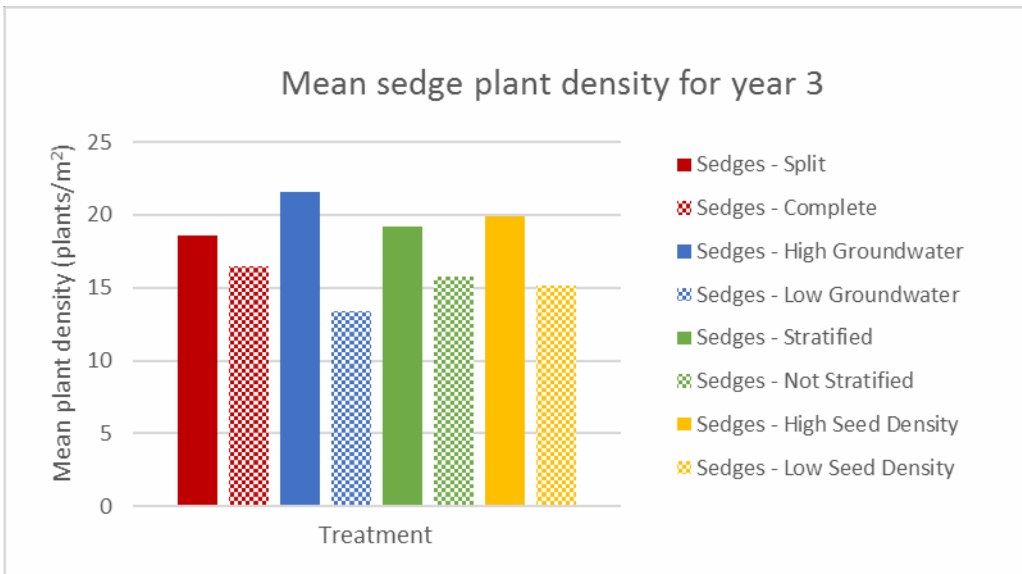

Figure 12. – Mean plant density (plants/m2) of sedges for each treatment in Year 3.

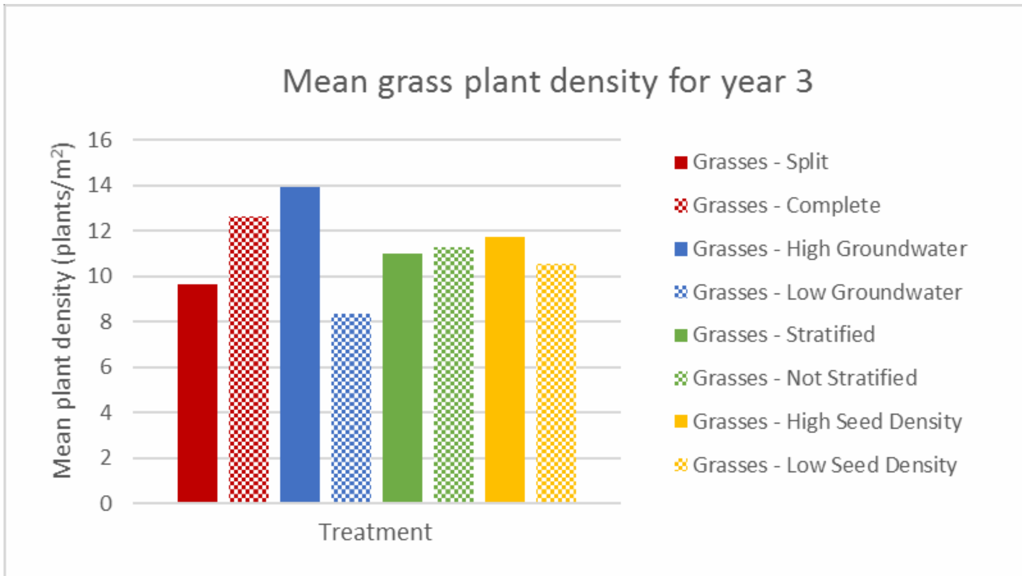

Figure 13. – Mean plant density (plants/m2) of sedges for each treatment in Year 3.

Plant Density

In year 3, high groundwater level, stratification, and high seed density significantly ($p < 0.05$) increased the total number of plants in the mesocosms (Table 4). Of these, high groundwater level had the greatest effect, increasing the total number of plants per mesocosm (m^2) by 19.1 ($p < 0.001$). The split-set treatment had a significant negative effect on the total number of plants, decreasing the number of plants by 8.7 per mesocosm ($p < 0.001$). As shown in Table 4, the split-set treatment significantly, negatively affected the number of forbs and grasses ($p = < 0.001$ & 0.037 respectively). High groundwater had the greatest effect, significantly increasing the number of forbs, sedges, and grasses. Stratification and high seed density had a significant positive effect on forbs and sedges, but they had no effect on the number of grasses. There were no interaction effects.

Table 4. – Summary of differences in plant density means for the effect of each treatment on the species groups of forbs, sedges, and grasses, as well as the total number of plants for year three. The complete seed set, high groundwater level, stratified seed, and high seed density are the base levels for comparison. Blue highlighted boxes indicate a significant positive effect ($p < 0.05$). Red highlighted boxes indicate a significant negative effect ($p < 0.05$).

	Differences in means (plants/m^2)			
Species Type	Split-set	High groundwater	Stratified	High density
Forbs	-7.8	5.4	5.1	5.7
Sedges	2.1	8.2	3.4	4.8
Grasses	-3	5.6	-0.3	1.1
Total number of plants	-8.7	19.1	8.3	11.6

The high groundwater increased the plant density in 11 of the 20 species that were present in the mesocosms (Table 5). The high groundwater treatment had a positive effect on all but one (*S. gigantea*) of the 20 species. Stratification had a significant positive effect on the plant density of five of the species and a significant negative effect on two species. High seed density had a significant positive effect on the plant density of three species, while having no effect on the rest of the species.

The species-set treatment in year 3 again had varied results. Of the nine non-aggressive forb and grass species, only three experienced a significant positive effect from the split-set treatment. Of the five non-aggressive sedge species, three experienced a significant positive effect from the split-set treatment. As expected, the split-set treatment had a significant negative effect on the plant density of aggressive species. There were no interaction effects.

Table 5. – Summary of differences in plant density means for individual species in regards to stratification, groundwater level, species set, and seed density. The complete species set, high groundwater level, stratified seed, and high seed density are the base levels for comparison. ANOVA was conducted separately for each species. Blue highlighted boxes indicate a significant positive effect ($p < 0.05$). Red highlighted boxes indicate a significant negative effect ($p < 0.05$). Asterisks denote an aggressive species.

	Differences in means (plants/m^2)			
Species	Split-set	High groundwater	Stratified	High density
Calamagrostis canadensis	2.6	1.0	-2.8	0.9
*Glyceria striata**	-2.5	1.2	0.8	0
*Leersia oryzoides**	-1.7	1.0	1.6	-0.6
Juncus dudleyi	0.2	2.9	-0.5	0.4
*Scirpus tabernaemontani**	-1.6	1.5	1.4	0.5
Asclepias incarnata	0.7	1.3	0.6	0.1
Aster puniceus	3.3	1.3	0.2	0.8
Eupatorium perfoliatum	1.3	1.2	1.5	0.4
*Helenium autumnale**	-5.6	0.9	1.0	1.0
Lobelia siphilitica	1.1	0.7	0.6	1.0
Scutellaria lateriflora	-0.1	0.1	0.2	0
*Solidago gigantea**	-8.7	-1.2	-2.0	0.8
Cicuta maculata	0.1	2.8	3.4	1.6
Stachys palustris	0.2	0.3	-0.3	0
Carex cristatella	0	0.4	0.2	0.3
Carex hystericina	1.1	2.5	0.4	0.6
Carex molesta	0.7	0.6	0.3	1.0
Carex stipata	1.1	0.9	0.9	0.4
Carex tribuloides	2.6	2.9	1.5	1.9
*Carex vulpinoidea**	-3.4	1.0	0.2	0.6

Diversity

In year 3, high groundwater and stratification had a significant positive effect on Simpson's index of diversity (Figure 14). High groundwater increased diversity by 2.38 ($p<0.001$). Stratification increased diversity by 1.7 ($p<0.001$). High seed density had no effect. The split-set treatment had a significant negative effect, decreasing diversity by 1.0 ($p = 0.027$). Groundwater level again had the greatest impact on diversity. There were no interaction effects.

High groundwater level increased species richness by 2.8 species per m^2 ($p<0.001$). The stratification treatment increased richness by 1.7 species per m^2 ($p=0.002$). High seed density increased richness by 1.2 species per m^2 ($p=0.023$). The split-set treatment decreased richness by 2.1 species per m^2 ($p<0.001$).

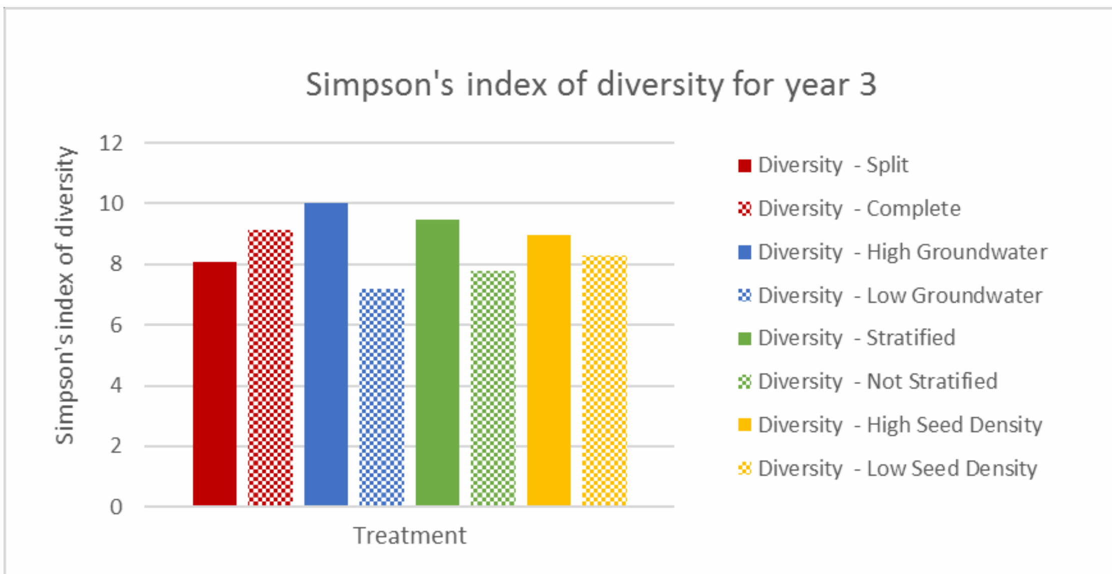

Figure 14. – Mean diversity score (Simpson's index of diversity) for each treatment in Year 3.

Comparison Among Years

General

As is shown in Figures 15-18, the mean plant density in the mesocosms increased from year 2 to year 3. Year 1 saw elevated plant densities, but this is likely due to counting errors as explained in the year 1 results.

The difference between the two levels of each treatment seemed to remain fairly consistent from year 2 to year 3. This is evident by the mostly parallel lines between year 2 and year 3 in Figures 15-18.

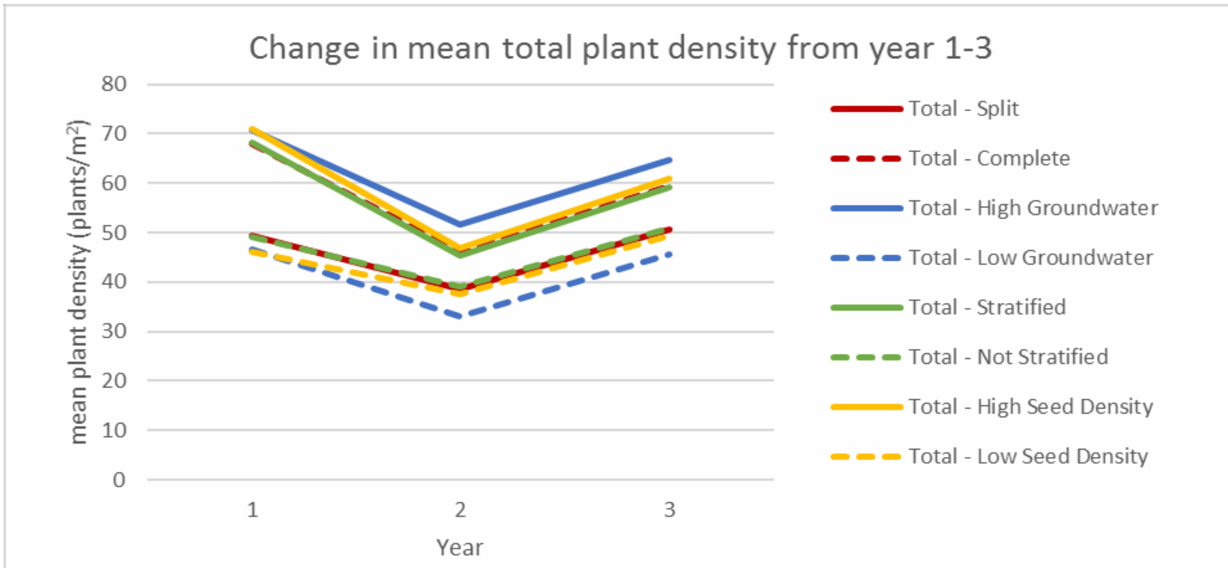

Figure 15. – Change in mean total plant density (plants/m2) for each treatment over the three years of the experiment.

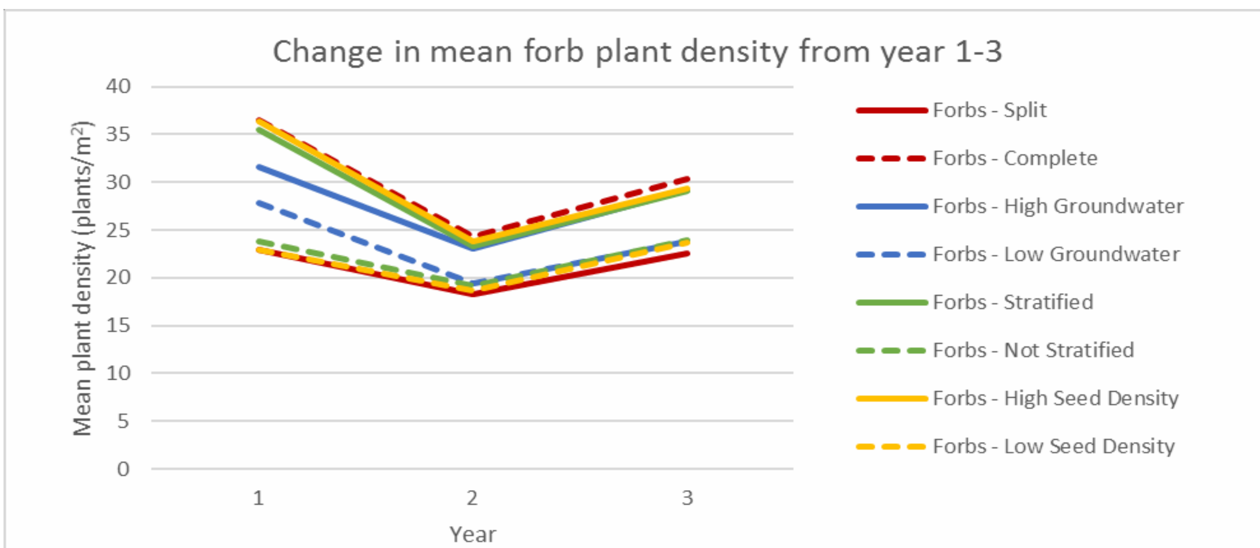

Figure 16. – Change in plant density (plants/m2) of forbs for each treatment over the three years of the experiment.

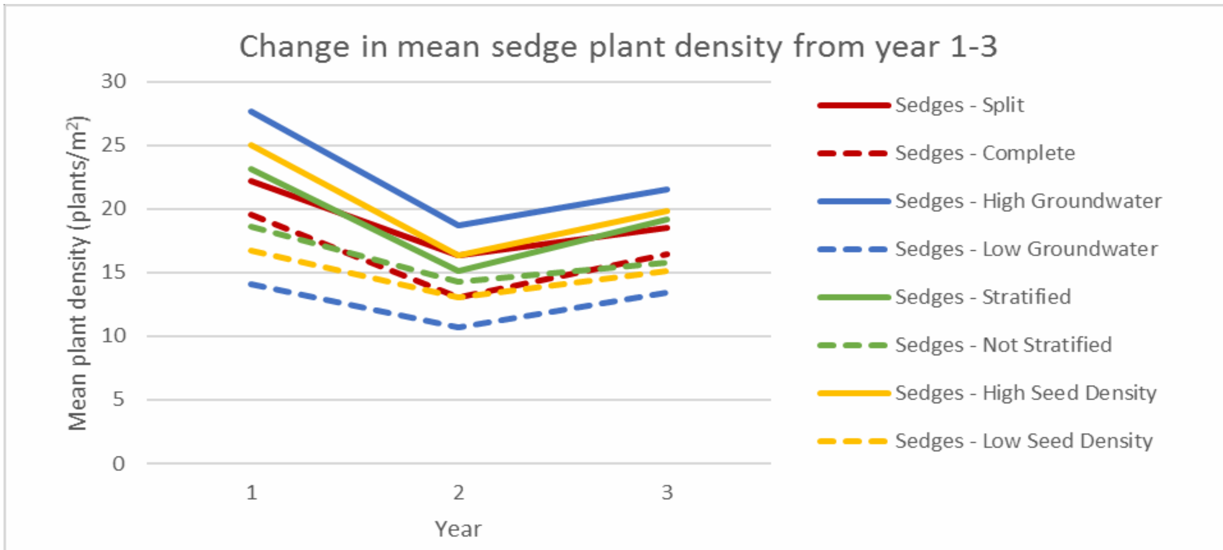

Figure 17. – Change in plant density (plants/m2) of sedges for each treatment over the three years of the experiment.

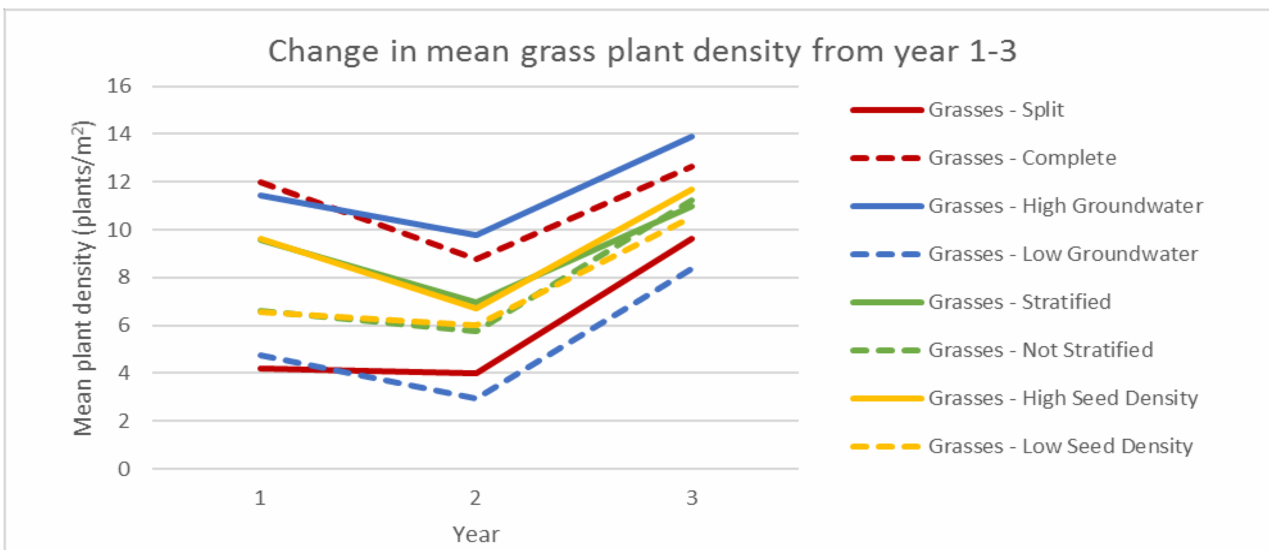

Figure 18. – Change in plant density (plants/m2) of grasses for each treatment over the three years of the experiment.

Plant Density

The treatments generally had a much greater effect in year 1 than in the subsequent years. In year 1, high groundwater level, high seed density, and stratification all had significant, positive effects on the plant density of the species groups and total number of plants. This effect was also larger as shown by the large values in Table 1. In year 2, the effect of the treatments diminished.

In general, the results indicate that most of the effects of groundwater level, stratification, and seed density remained relatively constant from year 2 to year three (Table 6). Only general trends were measured. The significance of the differences between year 3 and year 2 were not calculated.

As is evident in Table 6, high groundwater level, stratification, and high seed density saw an increase in amplitude of effect on forbs, sedges, and total number of plants from year 2 to year 3. In other words, the effect of these treatments remained constant or strengthened instead of diminishing. However, the effect of high groundwater level and stratification on grasses diminished.

In year 3, the negative effect of the split-set treatment on forbs became larger. If it is assumed that forbs are negatively affected by the split-set treatment, then it can be said that this effect was strengthened. The positive effect of the split-set treatment on sedges diminished from year 2 to year 3. The negative effect of the split-set treatment on grasses also diminished from year 2 to year 3.

Table 6. – Summary of the differences of plant density means between year 3 and year 2. Values were calculated by subtracting the mean plant density of each treatment of year 2 from year 3. The complete species set, high groundwater level, stratified seed, and high seed density are the base levels for comparison.

	Difference between Year 3 and Year 2 (plants/m^2)			
Species Type	Split-set	High groundwater	Stratified	High density
Forbs	-1.8	1.8	1.0	0.5
Sedges	-1.2	0.1	2.6	1.4
Grasses	1.8	-1.3	-1.5	0.4
Total number of plants	-1.2	0.6	2.1	2.3

Diversity

In year 3, the positive effect of stratification, high groundwater level, and the split-set treatment on diversity was larger than in year 2 (Table 7). In other words, those three treatments caused diversity to increase from year 2 to year 3. The effect of seed density on diversity decreased from year 2 to year 3. However, most of these changes were relatively small.

Table 7. – Summary of the differences in Simpson's index of diversity between year 3 and year 2. Values were calculated by subtracting diversity values of year 2 from year 3 for each treatment. The complete species set, high groundwater level, stratified seed, and high seed density are the base levels for comparison.

	Difference between Year 3 and Year 2 (plants/m^2)			
Variable	Split-set	High groundwater	Stratified	High density
Simpson's Diversity	0.4	0.1	0.7	-0.2

Biomass

Figure 19 displays the mean biomass harvested for each treatment. Though there are still differences between the two levels of each treatment, they are not very large differences. However, high groundwater did appear to result in an increase of more than 100 g of total biomass over the low groundwater level. Also note that high and low seed density treatments resulted in nearly the same mean biomass. Figures 20, 21, and 22 display mean biomass for forbs, sedges, and grasses respectively. There were no interaction effects.

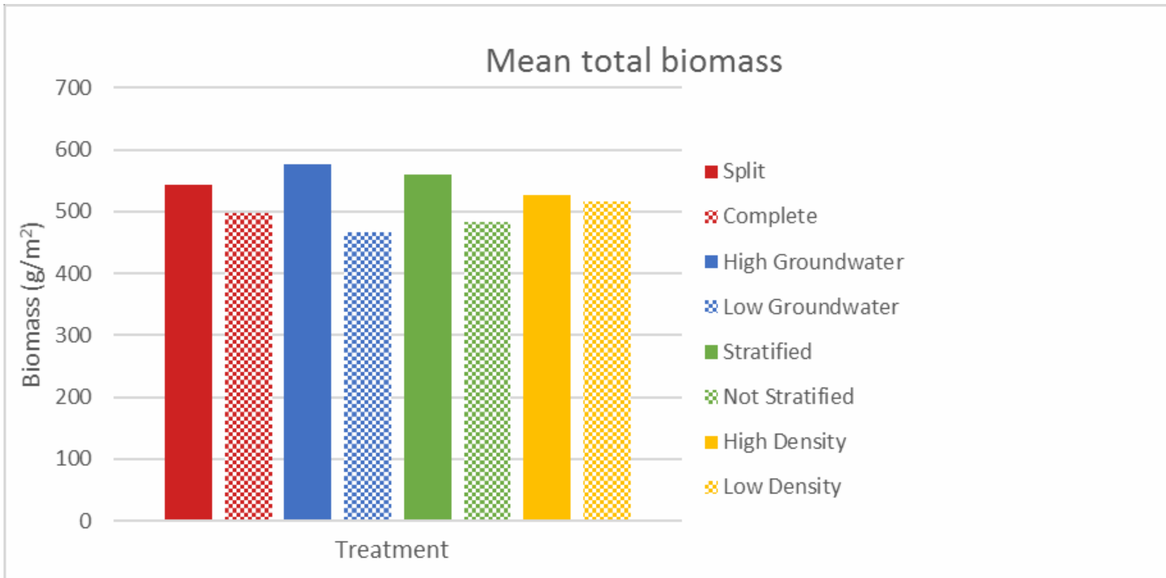

Figure 19. – Mean total biomass (g/m2) of all plants harvested for each treatment.

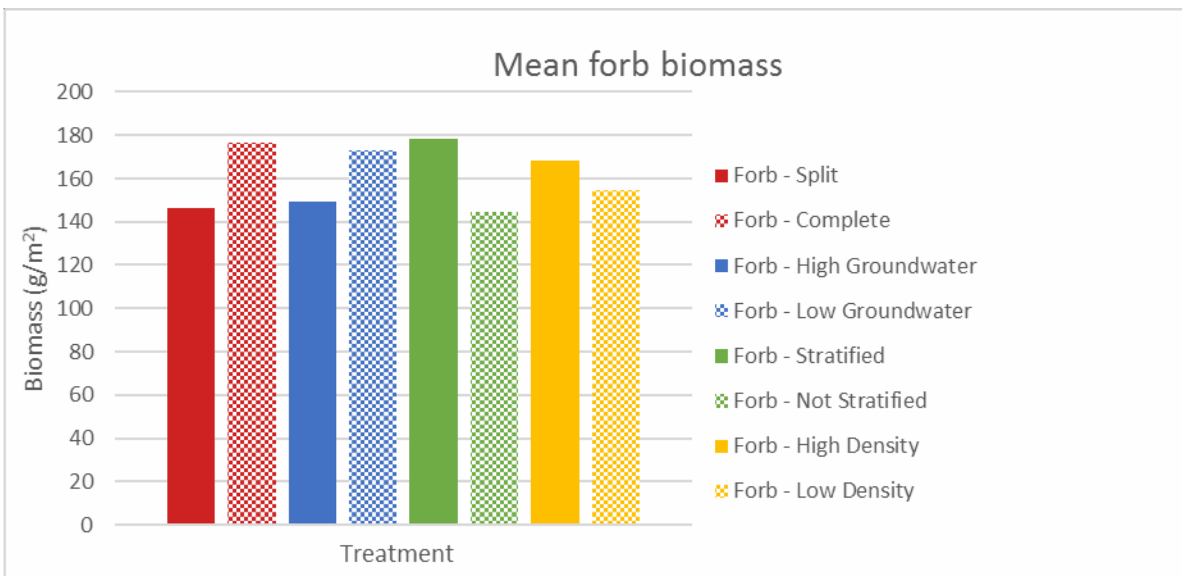

Figure 20. – Mean biomass (g/m2) of forbs for each treatment.

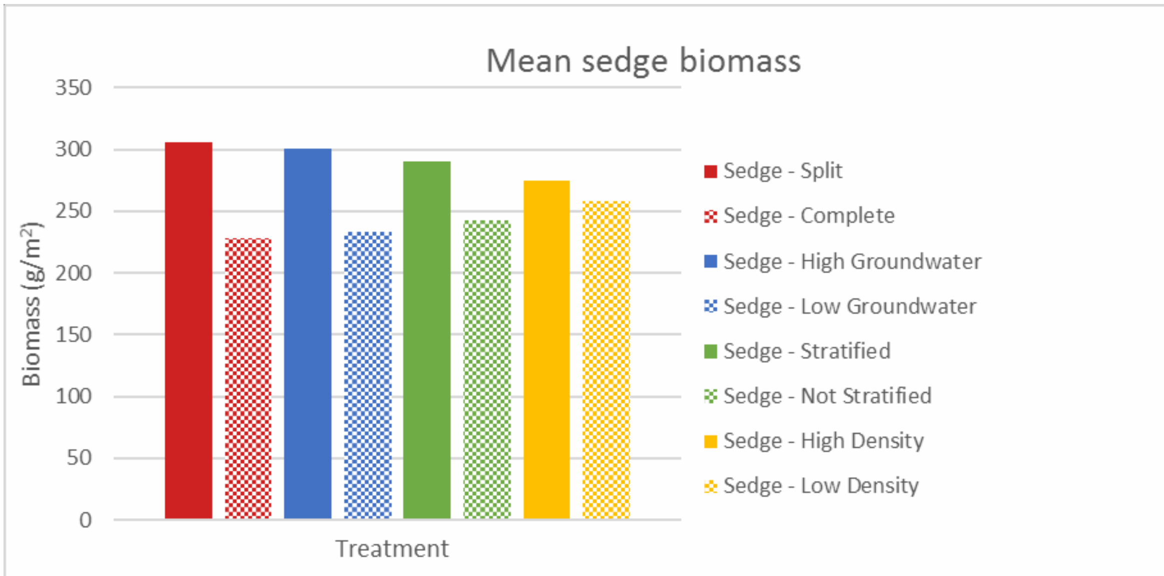

Figure 21. – Mean biomass (g/m2) of sedges for each treatment.

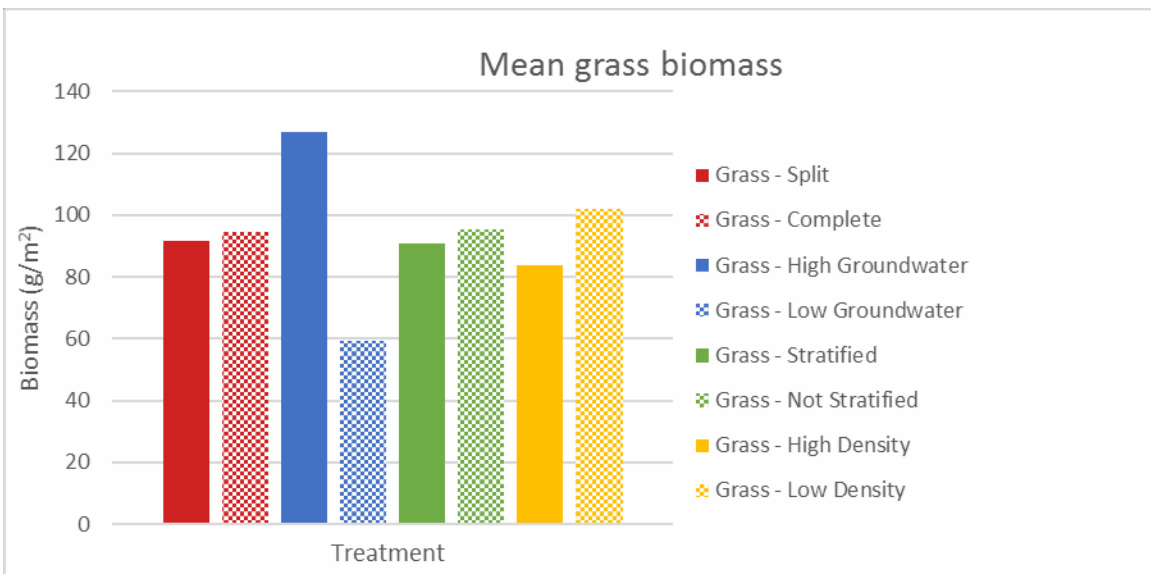

Figure 22. – Mean biomass (g/m2) of grasses for each treatment.

The effects of the species-set treatment, groundwater level, stratification, and seed density on the biomasses of forbs, sedges, and grasses species groups were generally less pronounced than in the plant density results. Stratification had a significant positive effect on forbs, increasing the biomass of forbs in each mesocosm by 34.0 g (Table 8) ($p = 0.04$). However, the r-squared value was very low (0.065). The rest of the treatments had no effect on the mass of forbs. The split-set treatment had a significant positive effect on sedges, increasing the mass of sedges by 78.1 g ($p = 0.04$, $r^2 = 0.052$). The rest of the treatments had no effect on the biomass of sedges. The high groundwater level had the only significant positive effect on grasses, increasing the biomass per mesocosm by 67.6 g ($p < 0.001$, $r^2 = .1259$). Finally, high groundwater level had a significant positive effect on the total biomass of plants in the mesocosms, increasing the biomass by 111.2 g per mesocosm ($p = 0.02$, $r^2 = 0.058$). As is evident by the low r-squared values, there was not a consistent relationship between the treatment variables and the biomasses of the species groups.

Table 8. – Summary of the differences in mean biomass per mesocosm (g/m2) for the effect of each treatment on each species group, including total biomass. The complete species set, high groundwater level, stratified seed, and high seed density are the base levels for comparison. Blue highlighted boxes indicate a significant positive effect ($p <0.05$).

	Differences in mean biomass (g/m^2)			
Species Type	Split-set	High groundwater	Stratified	High density
Forbs	-29.8	-23.6	34.0	13.3
Sedges	78.1	67.1	47.5	16.3
Grasses	-3.2	67.6	-4.4	-18.0
Total biomass of plants	45.1	111.2	77.0	11.6

The effect of the treatments on individual species (Table 9) was consistent with the results above. The split-set treatment had significant negative effects on aggressive species (species denoted with an asterisk), while having a significant positive effect on half of the non-aggressive species. The high groundwater level had a significant positive effect on four of five grass species, but had mainly mixed effects on all others. Stratification had generally positive effects on individual species, except for *Calamagrostis canadensis,* which decreased 35.8 g per mesocosm as a result of stratification ($p = 0.003$, $r^2 = 0.242$). Seed density had a very low impact on the biomass of individual species. Only *Carex cristatella* saw a significant increase in biomass (7.7 g) as a result of high seed density ($p = 0.041$, $r^2 = 0.075$).

Table 9. – Summary of the differences in mean biomass per mesocosm (g/m2) for the effect of each treatment on individual species. The complete species set, high groundwater level, stratified seed, and high seed density are the base levels for comparison. Blue highlighted boxes indicate a significant positive effect ($p < 0.05$). Red highlighted boxes indicate a significant negative effect ($p < 0.05$). Asterisks denote an aggressive species.

	Differences in mean biomass (g/m^2)			
Species	Split-set	High groundwater	Stratified	High density
Calamagrostis Canadensis	48.9	1.7	-35.8	-11.3
*Glyceria striata**	-17.3	13.5	0.8	-5.9
*Leersia oryzoides**	-10.0	6.7	9.4	-4.2
Juncus dudleyi	3.4	18.7	-1.2	2.1
*Scirpus tabernaemontani**	-28.0	27.0	22.3	1.1
Asclepias incarnata	2.2	1.9	0.6	0.7
Aster puniceus	30.2	-12.0	0.2	-1.4
Eupatorium perfoliatum	20.5	3.4	25.9	0.4
*Helenium autumnale**	-58.1	-16.9	-4.7	-2.3
Lobelia siphilitica	7.6	-6.5	-1.2	3.6
Scutellaria lateriflora	-0.2	0.2	0.5	0.2
*Solidago gigantea**	-37.9	-6.0	-5.1	1.3
Cicuta maculata	5.5	11.8	17.9	6.2
Stachys palustris	0.3	0.4	0	0.1
Carex cristatella	9.3	-1.5	-2.7	7.7
Carex hystericina	13.2	46.8	31.2	12.4
Carex molesta	26.2	-15.2	-4.6	-2.7
Carex stipata	0.4	-0.9	24.2	-16.5
Carex tribuloides	64.9	33.8	1.8	21.5
*Carex vulpinoidea**	-36.2	3.8	2.2	-5.8

Soil Temperatures

The soil temperature data shown in Figure 23 were indicative of the entire soil temperature dataset. The mesocosms with a high groundwater level experienced smaller diurnal temperature fluctuations than the mesocosms with a low groundwater level.

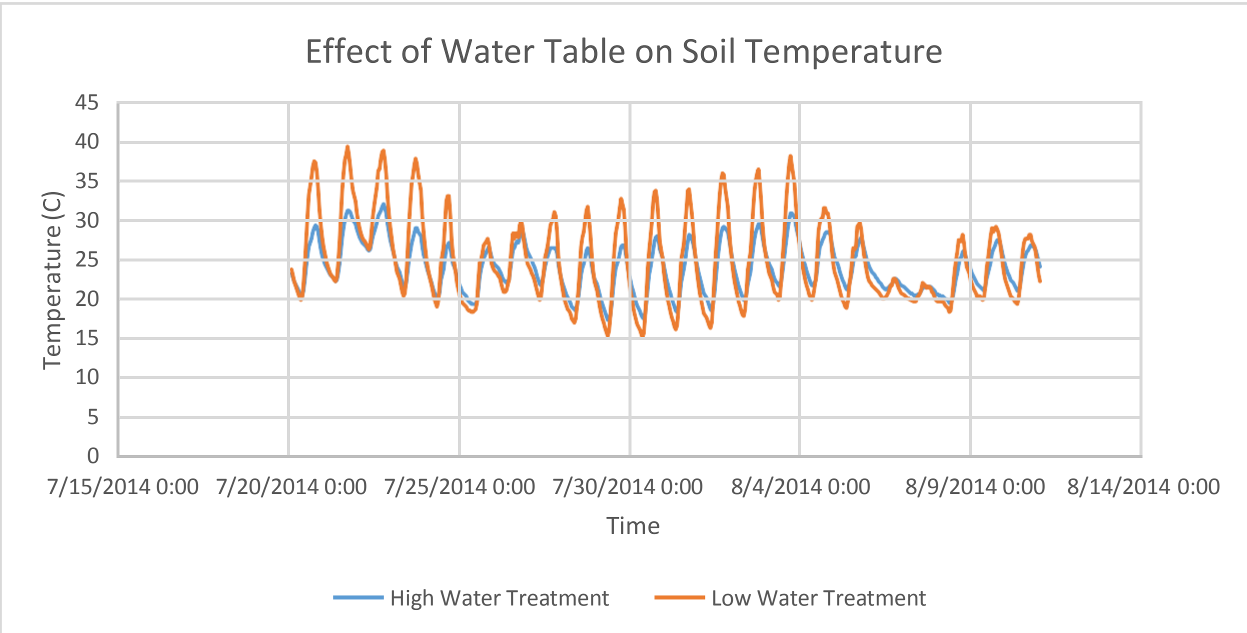

Figure 23. – Fluctuations in soil temperature for mesocosms with a high groundwater level versus mesocosms with a low groundwater level.

Discussion

Year 1 (2014)

Though the experiment was not yet fully implemented during the first growing season, it appeared that groundwater level, stratification, and seed density played a major role in what germinated. Seedlings emerged from the soil very quickly in those mesocosms that contained one or more of "high" treatments, i.e., when high groundwater level, stratification, or high seed density were assigned to the mesocosm, the plants had a very quick response. All of this is clearly seen in Table 1. Each of the three treatments (species-set treatment was not yet able to be analyzed) had significant effects on the number of forbs, sedges, grasses, and total number of plants.

The results in the first year, however, mainly indicate the conditions required for germination. In our case, the high groundwater level, which kept the top of the soil moist throughout the growing season, resulted in more germination. Much of the seed in the low groundwater mesocosms may not have reached the minimum water requirements for germination. These results are consistent with other sedge meadow research on soil moisture. Budelsky and Galatowitsch (2000) also indicate that control of water-levels is of utmost importance during the first growing season for the general establishment of sedge meadow species. It is important to note that Budelsky and Galatowitsch (2000) also found that water level fluctuations in the first year did not indicate the structure of the mature stand after three growing seasons in some sedge species. In other words, though the results of the first year of this experiment indicate that water level plays a major role in plant density of sedge meadow species, it does not necessarily indicate the structure of the sedge meadow community down the road.

Stratification also affected germination the first year, especially in forbs, which experienced 11.8 more plants per mesocosm when stratified as opposed to not stratified (Table 1). This may be because many species, including sedge meadow species, require a period of cold-wet stratification in order to germinate. This is consistent not only with the results of this study but also with Schultz and Rave (1999) and Budelskey and Galatowitsch (1999), who also found that many species, including sedges, benefit from cold-wet stratification.

Finally, seed density was also important, as expected. Because seeds do not yet heavily compete for resources, doubling the number of seeds roughly corresponded to about twice as many germinations. However, this effect was not necessarily consistent throughout all three growing seasons, as will be described later.

Overall, when restoring a sedge meadow community, having a high groundwater table, stratifying the seeds, and increasing seed density does contribute to a number of germinations. However, the success of a restoration effort may not be decided by the results of the first year.

Year 2 (2015)

In year 2, the plants and community within each mesocosm had taken shape. Those mesocosms that received the split-set treatment had now been planted with all the aggressive species that were not present until after the first growing season.

Groundwater level had large effects on plant density in year 2. All of the species groups (forbs, sedges, and grasses) were significantly, positively affected by the high groundwater treatment. This continues the trend from year 1, but the effect did diminish in year 2, i.e., the differences in means between the high groundwater level and the low groundwater level were larger in year 1 than in year 2. This may be because some of the seed that did not germinate in the low groundwater treatments finally received enough groundwater (perhaps from large rain events) to germinate, while most of the viable seed in the high groundwater treatments germinated early on in year 1. This seemed to be especially true with regard to the sedge group. In year 1, high groundwater level resulted in the germination of 13.7 more sedges per mesocosm on average than the low groundwater level (Table 1). In year 2, that number decreased to 8.1 (Table 2). In other words, sedges continued to germinate in the low groundwater treatments during the second growing season, while the number of sedge germinations in the high groundwater treatments had seemingly reached their peak. It is important to note, however, that despite this decrease from year 1 to year 2, the sedge group still experienced the largest effect (8.1) from the high groundwater treatment as compared to forbs (3.6) and grasses (6.9) (Table 2).

In year 2, we also have individual species data for each of the treatments (Table 3). The individual species data for the groundwater treatment are consistent with the species groups results. Most of the species, especially the sedge species, were significantly, positively affected by the high groundwater treatment. As noted in the results, *Solidago gigantea* was the only individual species that experienced a significant negative effect from the high groundwater treatment.

The results from the stratification treatment were similar to the results of the groundwater level treatment in year 2. For instance, the effect of stratification on each of the three species groups was reduced in year 2 as compared to year 1. In fact, the only group that stratification still had a significant effect on was forbs. This reduction in strength of effect is likely due to seeds continuing to germinate in the not stratified mesocosms during year 2 while the stratified mesocosms had already approached peak germination rates during year 1. The results with regards to individual species also reflect this. Only three species still experienced a significant increase in plant density due to stratification in year 2 (Table 3). The results for stratification suggest that though stratification plays a large role in germination, as found by Schutz and Rave (1999), it may not significantly affect the plant density of sedge meadow species in the following years.

Seed density became a less important factor in the plant density of sedge meadow species in year 2. The effect of high seed density on plant density decreased by a large margin for each of the species groups from year 1 to year 2. However, the explanation for this change cannot be the same as for the groundwater level and stratification treatments. It would be expected that in the second year, the effect of density should remain the same, if not increase. In year 1, it is likely that the same percentage of seeds germinated in the high and low seed density treatments, but because the high seed density treatment contained twice as much seed, twice as many seeds germinated. In year 2, if another small percentage of seed germinated in each treatment, the high seed density would again experience a larger plant density increase because there is more seed that had a chance to germinate. This is not what we see in the results however. One explanation for the results could be crowding. For example, since there were more plants in the high seed density treatments, this could have caused shading, which may have prevented the germination of more seed. The low density treatments may not have experienced this problem because there was less of a shading effect. A study by Schutz and Rave (1999) supports this concept by showing that sedge germination increases with increased temperature and light exposure. Shading would cause both a reduction in day-time temperature and light availability. Wetzel and van der Valk (1998) also showed that canopy structure and shading play a role in species response.

The most interesting results from year 2 pertain to the split-set treatment. To reiterate, in those mesocosms that were treated with the split-set treatment, aggressive species were not seeded until November after the first growing season. In the mesocosms that were subject to the complete-se treatment, all of the species, including the aggressive species, were seeded in May before the first growing season. In year 2, there is a major caveat that must be first elaborated upon before the results can be understood. Aggressive species in the mesocosms assigned to the split-set treatment had only one growing season to germinate and establish, whereas their non-aggressive counterparts had twice as long, or two full growing seasons. Though this alone may be enough to explain the variance in the data, it does not necessarily mitigate the results. First year establishment could very well be correlated with the structure of mature stands after multiple growing seasons. This would lend to the idea that sedge meadows are subject to priority effects, which will be discussed more later on. Thus, we will keep both possibilities in mind when discussing year 2 results.

As shown in Table 2, the split-set treatment negatively affected plant density in forbs and grasses. This is consistent with the caveat explained in the previous paragraph. However, this was not the case for sedges. In fact, sedges in general had a significantly higher plant density under the split-set treatment. Furthermore, the proportion of non-aggressive sedge species that were significantly, positively affected by the split-set treatment was much higher than the proportion of non-aggressive forb and grass species. To elaborate on this, four of five non-aggressive sedge species saw a significant increase in plant density in the split-set treatment. In contrast, only three of the nine non-aggressive grass and forb species were significantly, positively affected by the split-set treatment. These year 2 results support the idea that particular sedge species are sensitive to priority effects, or rather that the sedge species in this study are sensitive to competition in the first year of establishment. In other words, sedges may be less likely to establish when dominant, aggressive species are already present.

The high groundwater treatment showed the highest increase in species diversity, increasing Simpson's diversity by 2.4. This increase in diversity is likely because fewer seeds and species were water-limited under the high groundwater treatment. This allowed a larger number of species to germinate and establish. In our experiment, though the high groundwater treatment caused the top of the soil to be damp throughout the growing season, the top of the soil was not super-saturated nor was there standing water. Stratification and high seed density also had a significant positive effect on diversity for similar reasons. The high groundwater treatment also had the largest positive effect on species richness in year 2.

Year 3 (2016)

In year 3, community structure seemed to be stabilizing, perhaps indicating structure in years to come. Instead of regressing towards the mean, the results from year 3 actually remain pretty consistent with year 2, as shown in Table 6. Importantly, this suggests that the structure of the sedge meadow community (plant density and diversity) as a result of the treatments, would continue to persist in the future.

The high groundwater treatment again had the largest effect on the species groups as well as the individual species. In fact, more than half the species experienced a significant increase in plant density due to the high groundwater treatment. Again, the results from year 2 carried over to year 3.

Stratification still had a positive effect on the species groups as well as the individual species (Table 4 and Table 5). The only real outlier was the effect of stratification on *Calamagrostis canadensis*. Stratification had a very significant negative effect on this species, but it is most likely an anomaly. A possible explanation, however, is that in mesocosms that were less dense because they were assigned the non-stratification treatment, *Calamagrostis canadensis* was able to spread by rhizomes. These rhizomes may have been counted as new plants instead of part of a single plant. The over-counting of this species may have also affected the other results of the other treatments.

The significance of the effect of seed density on plant density was the lowest of all the treatment types. The number of individual species that was positively, significantly affected by high seed density was only three, which is two less than the year before. This is likely because of two reasons. The first is the same as the explanation given in the year 2 discussion of seed density, which is that shading caused a reduction in germination in the high seed density treatments. Another possible explanation for the reduction in effect from year 2 to year 3 is plant mortality. In the high seed density mesocosms, which were initially much denser in plant matter than the low seed density mesocosms, the larger plants shaded out very small seedlings, which caused those plants to die. In the low seed density mesocosms, there was not as much shading. There was no data collected for plant mortality, but we did observe small seedlings die out in the denser mesocosms. Essentially, the plants filled the space in the mesocosms regardless of seed density. Each mesocosm could only support a certain number of plants. In summary, seed density may play a role in the plant density in the first few years, but by the time the plants have become fully mature, seed density no longer a significant effect. It is important to note that Budelsky and Galatowitsch (2000) found that planting density did not affect plant mortality. However, their study used planted seedlings instead of seed.

Though the split-set treatment had no effect on the sedge group, three of the five non-aggressive sedge species experienced a significant positive effect as a result of the split-set treatment, whereas only three of the nine non-aggressive grass and forb species saw a significant positive effect as a result of the treatment. The best explanation for this phenomenon is the same as was presented in the year 2 results. It appeared that sedge species, when given a head start in the germination race, were able to establish and spread and slow the rate of germination for aggressive species that were seeded after the first growing season. The flip-side of this is that sedges were not able to compete well with the aggressive species if they were seeded at the same time.

In sedge meadow restoration, one of the major problems is invasive species. This can be in the form of non-native plants such as Johnson Grass or Reed Canary Grass or native plants such as River Bull Rush or cattail. These species are a problem because they are very aggressive. If we assume that these invasive species may react similarly to the aggressive species in this experiment, then the sedges in the experiment suddenly become more important. For instance, if restorationists could establish sedge species, such as the ones in the experiment, then it may prevent or slow the establishment and spread of invasive species. Though this hypothesis is not tested in this experiment, the data suggest that this as a possibility.

Another topic of discussion related to those above is the decrease in the plant density of aggressive species in response to the split-set treatment. To further explain this point, we will put the data in another perspective by comparing the average number of aggressive species versus non-aggressive species directly. First, since six of the 20 species in the mesocosms were aggressive species, we would expect 30% of the total plant density to be aggressive species. This, of course, assumes that aggressive species and non-aggressive species have the same chance of germinating and establishing, which is not the case. This can be seen in the complete-set treatment or rather the mesocosms that were seeded with all the species at once. In those mesocosms, 46.0% of the total number of plants were aggressive species. This suggests that aggressive species, like the ones in this experiment, germinate and establish at a higher rate than non-aggressives. When we looked at mesocosms assigned the split-set treatment however, the story is completely different. When the seeding of aggressive species was held off until after the first growing season, only 5.6% of the total number of plants were aggressive species at the end of year 3. That is a remarkably low percentage. It also did not change much from the second year, which was also low at 3.4%. The low change between years suggests that this trend could continue in the future.

These data also provided a lot of support for the priority effects proposed earlier. Essentially, in sedge meadow communities, it seems that those plants that establish first have a much greater plant density than those that come in later. Hood (2013) found that suppression of *Typha angustifolia* (narrow-leaf cattail) by mowing led to 60% of the treatment area being replaced with native sedges after four years. Though their form of suppression was by mowing and not the split seeding of aggressive species, the concept is still the same. They go on to confirm that competition from an aggressive species like cattail early on in a restoration can cause a reduction in native species plant density (Hood 2013).

In year 3, both the high groundwater level and stratification remained a significant positive effect on diversity. There were likely fewer seeds that were water limited in the high groundwater treatment, which is the most likely cause of increased diversity. In other words, it gave each species a better chance of germinating in each mesocosm, which would increase Simpson's diversity in that mesocosm. Stratification likely worked in the same manner. Seed density had no effect on diversity in year 3. This means that the low seed density treatment still contained enough seed for most of the species to germinate in the mesocosms. Based on this negative trend (the decrease in the effect of high seed density from year to year), it is likely that seed density does not play a role in determining the structure of the sedge meadow community after the stand has matured. The split-set treatment had a significant negative effect on diversity, but this is likely because so few of the aggressive species were able to establish in the split-set treatment. This would cause a decrease in Simpson's diversity index. The high groundwater treatment also had the largest positive effect on species richness in year 3.

Biomass

Unlike the plant density and species diversity calculations, which only used the number of individual plants, the biomass analysis looks at the total biomass of each individual species in each mesocosm. The results were generally similar to the plant density results, although most of the values were not found to be significantly different. This, along with very low r-squared values, indicate that the treatment effects did not explain much of the variance in the data.

Much like the plant density results, the effect of the high groundwater treatment on the biomass of plants was very important for the most part. For instance, grasses saw an increase in biomass due the high groundwater treatment (67.6 g). The high groundwater treatment also had the largest overall effect on plant biomass, increasing the total biomass by 111.2 g per mesocosm (Table 8).

The effect of stratification on the biomass of plants was also similar to the plant density results. Forbs and sedges responded well to stratification, however only the effect of stratification on forbs was significant. Grasses had no significant response to stratification, similar to the plant density results.

The seed density biomass results supplied even more evidence that seed density has no effect on the response of sedge meadow species. Seed density had no effect on all species groups, including the total biomass of plants. It also only had one significant effect on any individual species, and that was *Carex cristatella*, which experienced a 7.7 g increase in biomass per mesocosm under the high seed density treatment.

The effect of the split-set treatment was very interesting. Much like what we saw in the plant density results, the split-set treatment had a significant positive effect on the sedge group. There was an increase of 78.1 g of sedges per mesocosm in the split-set treatment. This may be a little skewed, however, because only one of the six sedges was an aggressive species, whereas there were five aggressive species amongst the grasses and forbs. When looking at the individual species results, it appears that non-aggressive sedges, grasses, and forbs all experience similar responses to the split-set treatment (Table 9). Half of the non-aggressive species experienced significant increases in biomass when subject to the split-set treatment. On a further note, all of the aggressive species again had significantly less plant biomass in the split-set treatment.

Why did the treatments have fewer significant effects on biomass than on plant density? This difference is most clearly seen when comparing Table 4 to Table 8. In the high level of each treatment (excluding the split-set treatment), the plant density data showed that more plants germinated and established. This means that mesocosms that were assigned high treatments had a higher density of plants, or more total plants per mesocosm. Because of this higher density, each individual plant had less space to grow. Though there were fewer plants in the low treatment level mesocosms, each plant had more space to grow and accrue more biomass. Essentially, these two factors tend to balance each other out, so the biomass of plants in each mesocosm tended to be closer than might be expected by the plant density results.

Soil Temperature

The soil temperature of the mesocosms was also recorded throughout the growing season to determine if there was a temperature difference between the high and low groundwater treatments. As shown in Figure 23, there was a definite difference in the temperature scheme between the high and low groundwater treatments. The low groundwater treatment mesocosms had a higher average diurnal temperature variation as compared to the high groundwater treatment. Because of this, we cannot rule out that soil temperature affected germination and establishment in the mesocosms. There is a chance that the combination of groundwater treatment level and soil temperature played a role in determining the response of the sedge meadow species. However, this experiment did not control soil temperature in the mesocosms, so we cannot comment on the effect of soil temperature on plant response, only that it may have played a role.

Conclusions

Four major conclusions can be drawn, each related to one of the four treatments. First, when restoring sedge meadows by seed, adequate water level or soil moisture is of the utmost importance. Throughout the analysis, it was clear that the high groundwater treatment had the greatest positive effect on the response of the sedge meadow species. The second conclusion is that stratification will not hurt. Stratification did not always yield beneficial results, but it was very rarely detrimental to sedge meadow species response. If restorationists have the opportunity to seed an area during the fall, it is recommended. The third conclusion is that increasing seed density has little to no effect on the plant density, diversity, or biomass of sedge meadow species. It is therefore not recommended to increase the amount of seed used during the restoration more than the USDA recommend density of 420 seeds per square meter. The fourth and final conclusion is that delaying the planting of aggressive species significantly decreases the plant density and biomass of aggressive species in the sedge meadow community. If a restorationist is worried about certain aggressive species becoming overly dominant in the sedge meadow, they can delay the seeding of those species by one year.

This experiment poses two more areas of potential research. First, because of the interesting results of the split-set treatments, researches should investigate the effect of establishing sedge meadows before invasive species are introduced. Our experiment suggests that establishing a sedge meadow community could slow the intrusion of invasive species. The second area of potential research is that of water level because the high groundwater treatment had such a significant effect on sedge meadow response.

CHAPTER III: EFFECT OF SMALL SCALE DIFFERENCES IN GROUNDWATER LEVEL ON SEDGE MEADOW RESPONSE

Mitchell A Baalman

Abstract

In a follow-up study from 2015-2016 at the same research site, plant density and species diversity of sedge meadow species were measured in mesocosms treated with varying fine-scale groundwater levels and seeding dates. The groundwater levels were 0, 5, 10, and 20 cm measured below soil surface. The seeding dates were June 16, June 30, and July 14, 2016. The plant density of forb species increased by 0.6 plants/ 0.4 m^2 soil surface / cm decrease in groundwater level ($p < 0.001$). The seeding date of June 30 resulted in the highest average plant density of forbs at 6.9 per m^2 soil surface ($p < 0.05$). Shading and crowding caused by Scirpus tabernaemontani affected the plant density of other species. S. tabernaemontani decreased at the rate of -0.1 plants/ 0.4 m^2 soil surface/ cm decrease in groundwater level ($p < 0.001$). High numbers of S. tabernaemontani corresponded with decreased plant density of other species and decreased diversity. Seeding date and groundwater level had no effect on most other grass and sedge species. These results indicate that the presence of a dominant, fast-growing species such as S. tabernaemontani can have a large effect on sedge meadow response.

Introduction

This experiment was conducted to focus primarily on the effect of groundwater level on plant density and diversity, as well as looking at temporal effects such as planting time. This study used 20 species that can be found in Iowa wetlands. Because multiple studies have shown that small scale differences in soil water levels produce significant differences in seed germination and growth (Araya et al., 2010, Silvertown et al., 1999, Davies and Gowing, 1999), this experiment used finely controlled water levels in outdoor mesocosms. Identifying precise soil moistures and groundwater level that will produce the most diverse sedge meadow communities could be an important factor in determining the success of sedge meadow restorations.

The second treatment regime is seeding time. Studies have shown that germination rates vary seasonally in response to climate factors (Baskin et al. 1996), and other studies specifically identify different germination rates in sedge species in response to controlled temperature changes (Budelsky and Galatowitsch 1999). To determine optimum seeding times for restoration efforts, specifically in the Midwest, three seeding times were selected: June 16th, June 30th, and July 14th.

Methods

Location and Study Area

The location for this study was also at Hinds Farm. This irrigation farm is used primarily for research purposes and provides easy access to well water. Both experiments were conducted at the same location in order to limit environmental variation. In order to provide a level surface for the study, a crushed rock bed was constructed within a leveled wooden frame.

Water-control System

This experiment used a mesocosm complex where multiple units were connected to an irrigation system. Araya et al. (2010) outlined a system that was used as a template for this study. The system they created posed many advantages that contributed to the stability of this experiment. One of those advantages included being able to accurately control groundwater level, with fluctuations that varied by less than 15 mm over the course of 4 months during the growing season (Araya et al., 2010). Another advantage is the low cost and maintenance compared to other water-control systems (Araya et al., 2010).

This system was composed of three main parts: the mesocosms, control chambers, and a reservoir tank. The mesocosms consisted of 60 units or containers placed on the level platform structure. On the side of each container, very near the bottom, a small hose-pipe was attached. Each mesocosm was connected to one of four control chambers via a network of pipes depending on the groundwater level it was assigned. Each control chamber was set to control the groundwater level in the mesocosms at a certain height. All four of the control chambers were then connected to the main reservoir tank. Within each control chamber was a float-valve. The float-valve worked by shutting off the incoming water source once the water-level in the chamber reached a set height. When the water level dropped below that height, the valve reopened until the set height was again achieved. Each of the four control chambers was set to a different treatment height. This allowed the mesocosms to fill to the same height as their corresponding control chamber. Diagrams of the water control system and experimental layout are in Appendix D.

Before use, this system was tested for accuracy. With the containers still empty, the reservoir tank was filled with the local well-water. The water flowed through each control chamber until the systems reached equilibrium due to gravity because each mesocosm was level with the control chambers. Each mesocosm was then marked and measured to ensure that the height of the groundwater was at the desired condition. If there were any discrepancies in groundwater height in the mesocosms, fine-scale adjustments were made to the mesocosms or the control chambers to fix the problem.

This water-control system served as a nearly maintenance-free way to maintain accurate groundwater levels. For instance, when evapotranspiration occurred in the mesocosms, the system sought a balanced height, which caused the float valve to open until the desired groundwater level was again reached. However, if significant rain events occurred, water would simply back-flow into the control chambers. To account for this, holes in the control chambers were drilled at the desired groundwater height so that any excess water could drain out. Our system was able to reach equilibrium in only a few hours after a large rain event.

Mesocosms

This study used plastic containers with a top surface area of 0.20 m^2 and a depth of 40 cm. Each container had a 10-cm layer of chat or fine gravel on the bottom. The top layer was composed of soil from a wetland in northern Iowa. Each layer was separated by a porous fabric or membrane that allowed water to pass through while keeping the different mediums separate.

Seeds

The species used in this study were nearly the same as the species used in the first study. The species used were *Asclepias incarnata, Scutellaria lateriflora, Cicuta maculata, Stachys palustris, Carex molesta, Scirpus tabernaemontani, Aster puniceus, Helenium autumnale, Carex hystericina, Carex stipata, Carex cristatella, Glyceria striata, Carex vulpinoidea, Carex tribuloides, Eupatorium perfoliatum, Solidago gigantean, Calamagrostis Canadensis, Juncus dudleyi*.

The seeds were purchased from Prairie Moon Nursery, a company based in Winona, MN that specializes in native seed production and supply for individuals, landscaping, and restoration efforts. The seeds were stratified in a cold room at 4 degrees Celsius.

The seeding density was 420 live seeds per square meter (USDA guideline). This equated to 84 live seeds per mesocosm. Each species was equally represented in each mesocosm based on the percent pure live seed rating each sample was given according to Prairie Moon Nursery. Before seeding, the soil surface of each mesocosm was gently disturbed to ensure even bedding for the spread of seeds.

Treatments

The experiment was set up with a randomized block design. Each block consisted of 12 mesocosms. There were five blocks.

There were two different treatments: groundwater depth and season of planting. There were four groundwater treatment levels with respect to the depth below the soil surface: 0 cm, 5 cm, 10 cm, and 20 cm. The 0 cm level was equivalent to a groundwater level that is at the soil surface. Each of these treatment levels was replicated three times in each block for a total of 12 mesocosms.

The second treatment was the seeding date. There were three seeding dates (June 16th, June 30th, and July 14th). Each of these treatments was replicated four times in each block for a total of 12 mesocosms. Groundwater depth and seeding date were overlaid for a total of 12 possible treatment combinations.

Measurements

The plant density of each species for each mesocosm was counted at the peak of the second growing season in August 2016. The values recorded in the results are plants per mesocosm (0.20 m^2) Each plant was individually counted.

Soil temperature and water content were recorded with a Campbell CA 3000 data-logger, thermocouple temperature probes and soil moisture monitors (CS616 Water Content Reflectometer). The thermocouples and soil moisture monitors were placed 1 cm below the soil.

Analysis

Groundwater depth and season of planting had an impact on plant density and Simpson's index of diversity. We used multiple linear regression and ANOVA in the R-platform to calculate the differences in treatment means. See Appendix B for original ANOVA tables. See Appendix C for raw data.

Results

Soil Moisture and Temperature

All four groundwater treatment levels experienced the same average temperature of about 23.4 degrees Celsius over the course of the two growing seasons. The groundwater treatments of 0 cm, 5 cm, and 10 cm all had very similar diurnal temperature variations through the growing season, while the diurnal variations appeared to be larger for the 20 cm treatment. The soil moisture data collected from the Water Content Reflectometers were not quantitative, but it did provide a relative measure. The average reading for each treatment over the course of the two growing seasons is displayed in Table 9 below. The soil moisture appeared to decrease as the groundwater level decreased.

Table 9. – Unadjusted volumetric water content of each of the groundwater treatment levels. Values are for relative purposes and do not represent accurate volumetric water contents.

	O cm	5 cm	10 cm	20 cm
Volumetric Water Content	0.4	0.6	0.5	0.5

Plant density

The groundwater treatment effect on plant density was calculated using linear regression. Because of this, the values for slope of the regression shown in Table 10 can be described as the increase in plant density of plants per one cm decrease in groundwater level. For instance, forbs increased by 0.604 plants per mesocosm per one cm decrease in groundwater level. All groups had slopes significantly different from zero (Table 10). There were no interaction effects.

Table 10. – The effect of the groundwater level on the plant density of species groups. Slope indicates the average change in the number of plants per one cm decrease in groundwater level. A green box cell indicates significant ($p<0.05$).

Species Type	Slope	r^2
Forbs	0.60	.71
Sedges	0.15	.21
Grasses	-0.19	.14
Total number of plants	0.57	.55

The effect of seeding date on the plant density of the species groups varied by group (Table 11). Sedges and grasses responded very similarly to each of the seeding dates, whereas forbs had at least one planting date that was significantly different from the other planting dates.

The effect of groundwater depth and seeding date was also calculated for the individual species. Table 12 shows both groups of data. Few of the species were significantly affected by seeding date. However, half of the individual species were significantly affected by the groundwater level.

Table 11. – The effect of seeding date on the plant density of the species groups. Values indicate the average plant density for each species group. Green boxes indicate that the plant densities for that species group were all statistically different from one another ($p<0.05$).

	Average plant density per mesocosm (plants/0.20 m^2)		
Species Type	June 16th	June 30th	July 14th
Forbs	4.8	6.9	2.0
Sedges	9.1	9.3	7.1
Grasses	13.7	14.4	14.1
Total number of plants	27.7	30.6	23.3

Table 12. – The effect of groundwater level and seeding date on individual species. Slope indicates the average change in the number of plants per one cm decrease in groundwater level. Values under the dates indicate the average plant density of each of the species. Green boxes indicate significance ($p<0.05$).

		Average plant density per mesocosm (plants/ 0.20 m^2)		
Species	Slope	June 16th	June 30th	July 14th
Calamagrostis Canadensis	0.01	0.0	0.0	0.1
*Glyceria striata**	-0.07	0.4	0.8	0.5
Juncus dudleyi	-0.07	4.4	5.0	4.1
*Scirpus tabernaemontani**	-0.15	8.9	8.7	9.6
Asclepias incarnata	0.06	1.3	2.8	1.8
Aster puniceus	0.08	0.7	1.2	0.4
Eupatorium perfoliatum	0.00	0.1	0.0	0.1
*Helenium autumnale**	0.13	2.2	2.6	0.6
Scutellaria lateriflora	0.06	0.2	0.1	0.0
*Solidago gigantea**	0.24	1.6	1.6	0.9
Cicuta maculata	0.04	1.4	1.1	0.9
Stachys palustris	0.00	0.0	0.0	0.0
Carex cristatella	0.02	4.8	4.5	4.7
Carex hystericina	0.00	1.4	1.1	0.8
Carex molesta	0.01	0.0	1.0	0.0
Carex stipata	0.04	0.2	0.2	0.3
Carex tribuloides	0.00	0.2	0.3	0.0
*Carex vulpinoidea**	0.09	2.6	2.2	1.4

Diversity

The effect of groundwater level and seeding date on Simpson's index of diversity was also calculated (Table 13). Both groundwater level and seeding date had significant effects. As shown by the large slope (0.20), the lower groundwater levels also had a higher diversity. As groundwater depth decreased, diversity increased. There were no interaction effects.

Table 13. – The effect of groundwater level and seeding date on Simpson's diversity. Slope indicates the average change in the diversity index per one cm decrease in groundwater level. Values under the dates indicate the average diversity index for that date. Green boxes indicate significance ($p<0.05$).

		Average Simpson's diversity		
Species	Slope	June 16th	June 30th	July 14th
Simpson's Diversity Index	0.20	4.8	5.1	3.5

Discussion

Soil Moisture and Temperature

As indicated in the results section, the diurnal temperature fluctuations were fairly similar for the 0 cm, 5 cm, and 10 cm groundwater levels, while the fluctuations appeared to be different for the 20 cm level. Though the significance of these difference was not calculated, these patterns could help explain some of the plant density and diversity results (see below). The volumetric water content (vwc) data only showed relative values, but there was one important observation. The average vwc of the 5 cm and 10 cm groundwater treatments were very close together. This means that seeds in either of those groundwater treatments could have experienced roughly the same level of soil moisture. The effect of this will be elaborated in following sections.

Plant density

Though the effect of groundwater level on the plant density of species groups was significant, the plant density results were generally pretty scattered. For instance, though the sedge and grass group experienced a significant effect from groundwater level, their r-squared values were very low (0.21 and 0.14 respectively). Figure 24 shows that a straight line cannot easily be drawn across the means, which was typical of most of the data. Also note that there was a lot of variance in the data. For both sedges and grasses, there was a clear difference between the 0, 5, and 10 cm treatments and the 20 cm treatment. There was not much difference amongst the 0, 5, and 10 cm treatments. When comparing boxplots for each individual species, there is also a pattern where the 5 and 10 cm treatments have very similar plant density results. This could be because the 5 and 10 cm treatments had very similar soil moistures.

Despite the caveats mentioned above, there are still a few trends to discuss. More sedges germinated and established in the 20 cm groundwater treatment than in the other three treatments. The opposite was true for grasses, which had much lower numbers in the 20 cm treatment (Figure 24). Both of these phenomenon can likely be explained by one species. The most dominant species found in all of the mesocosms was *Scirpus tabernaemontani,* a very common wetland species that has a high affinity for moist soil. A very high number of this species germinated in all of the mesocosms, and it quickly grew, shading out the mesocosm in weeks. As seen in Table 12 though, there was a definite trend to *Scirpus tabernaemontani*. It decreased in plant density as the groundwater level decreased. The number of grasses tended to decline with decreasing groundwater level because *Scirpus tabernaemontani* was part of the grass group. Because this species was so dominant in the wetter mesocosms, it shaded out the rest of the mesocosm, which likely prevented the germination and establishment of many of the sedges. This is why we see the most sedges in the 20 cm treatment, despite evidence in the first experiment showing that sedges established better under wetter conditions. These results were also supported by Wetzel and van der Valk (1998) who found that canopy cover in wetland species plays an important role in biomass allocation. In their experiment, the quick growth of *Phalaris arundinacea* (Reed Canary Grass) caused shading and a large reduction in the biomass of other species (Wetzel and van der Valk 1998).

The effect of groundwater level on forbs was very similar to the effect on sedges. However, the regression for forbs showed a much higher slope (0.60) and r-squared value (0.71). The reason for the large increase in the plant density of forbs as the groundwater level decreased is a combination of the *Scirpus tabernaemontani* effect mentioned previously and the evidence from the first experiment showing that forbs tended to germinate and establish just as well under drier conditions (Table 8). Unlike the sedge group, which experienced conflicting effects, these two effects on forbs compounded, resulting in the large slope. To conclude, there was a higher number of forbs in the 20 cm groundwater treatment because it was drier and because there was not as much *Scirpus tabernaemontani*. This explanation is consistent with Dickson and Busby (2008), who found that higher densities of dominant grass species decrease the plant density of forb species. Though the study came to that conclusion by manipulating seeding density of grasses and forbs, a parallel can be drawn.

The effect of groundwater level on individual species is consistent with the species group results. Most of the forbs species, such as *Solidago gigantea* and *Helenium autumnale,* saw increases in plant density in response to decreasing groundwater levels. Only two of the sedge species, *Carex stipata* and *Carex vulpinoidea* were significantly affected by groundwater level.

Except for three species, *Asclepias incarnata, Helenium autumnale, and Carex vulpinoidea,* seeding date had no effect on plant density. This suggests that there is a wide time frame in which a sedge meadow restoration can be seeded.

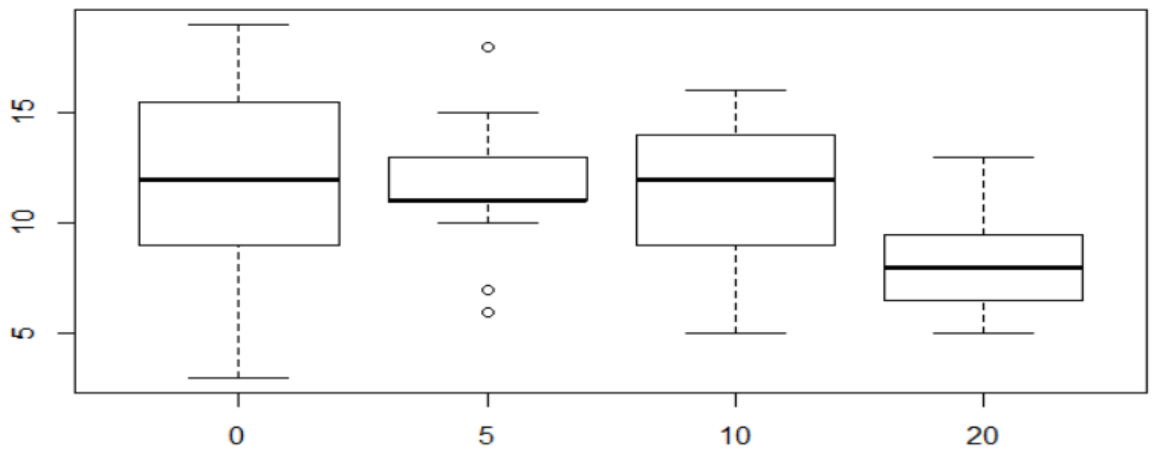

Figure 24. – Boxplot showing the average plant density of grasses (y-axis) for each of the groundwater treatments (x-axis).

Diversity

Lower groundwater level significantly decreased Simpson's index of diversity. The diversity index increased by 0.2 points for every one cm decrease in groundwater level (Table 13). This is likely due to an increase in forb germination in the 20 cm treatment as well as the reduction of *Scirpus tabernaemontani* in the 20 cm treatment, which allowed more light and space in those mesocosms and therefore more germinations.

Simpson's index of diversity was also significantly affected by seeding date. The middle date, June 30th, actually led to the most diversity (Table 13). This could be because that date corresponded with the optimum temperatures for germination. This would suggest that the end of June would be the best seeding date for restorations. However, there is another, perhaps more likely, explanation. The diversity index for each date, as shown in Table 13, matches up very nicely with the plant density results for *Scirpus tabernaemontani* (Table 12). In essence, the fewer *Scirpus tabernaemontani* plants there were, the higher the diversity score was. Though this is likely the best explanation for the differences in diversity for each seeding date, it does not necessarily mitigate the results. For instance, if we know a certain dominant species is going to germinate and establish best around a certain date, we can plan a restoration seeding around it. In our case, June 30th corresponded with the lowest *Scirpus tabernaemontani* plant density; so if that was a species that may become a problem in a given restoration, it would be wise to seed during that date.

Conclusions

The results showing that sedges do not have higher plant densities in higher groundwater level treatments do not support the results of the first study that showed sedges had high plant densities in high groundwater treatments. This, however, is mainly due to the over-prevalence of *Scirpus tabernaemontani.* If it was possible to remove the effect of this species from the dataset, we would likely see similar results to the first experiment. Because of this though, there is only one major conclusion that can be drawn from this experiment. One dominant species can dramatically alter the structure of a sedge meadow community. For a successful restoration, there must be a process or solution in mind for controlling dominant or aggressive species. In fact, this experiment supported one of the major treatment effects of the first experiment in Chapter II, which was that delaying the planting of aggressive species could dramatically slow the establishment of those species.

REFERENCES

Araya, Y.N., D.J. Gowing, and N. Dise. 2010. A controlled water-table depth system to study the influence of fine-scale differences in water regime for plant growth. Aquatic Botany: 92: 70-74.

Baskin, C.C., E.W. Chester, and J.M. Baskin. 1996. Effect of flooding on annual dormancy cycles in buried seed of two wetland *Carex* species. Wetlands 16: 84-88.

Bremholm, T. L. 1993. Evaluation of techniques for establishing sedge meadow vegetation. M.S. Thesis. Iowa State University, Ames, IA.

Budelsky, R.A. and S. M. Galatowitsch. 1999. Effects of moisture, temperature, and time on seed germination of five wetland carices: implications for restoration. Restoration Ecology 7: 86-97.

Budelsky, R.A. and S. M. Galatowitsch. 2000. Effects of water regime and competition on the establishment of a native sedge in restored wetlands. Journal of Applied Ecology 37: 971-985.

Carter, M. F., and J. B. Grace. 1990. Relationships between flooding tolerance, life history, and short-term competitive performance in three species of polygonum. American Journal of Botany 77: 381-387.

Dickson, T.L., and W. H. Busby. 2008. Forb species establishment increases with decreased grass seeding density and with increased forb seeding density in a northeast Kansas, U.S.A., experimental prairie restoration. Restoration Ecology 17: 597-605.

Davies, W.J. and D.J. Gowing. Plant responses to small perturbations in soil water status. M.C. Press, J.D. Scholes, M.G. Barker (Eds.), Plant Physiological Ecology, Blackwell Science, Oxford, UK (1999), pp. 67–89Dickson, T. L., and W. H. Busby. 2008. Forb Species Establishment Increases with Decreased Grass Seeding Density and with Increased Forb Seeding Density in a Northeast Kansas, U.S.A., Experimental Prairie Restoration. Restoration Ecology 17: 597-605.

Eggers, S.D., and D.M. Reed. 1997. Wetland plants and plant communities of Minnesota and Wisconsin. (2nd edition). U.S. Army Corps of Engineers, St. Paul, MN.

Fraser, L. H. and P. Keddy. 1997. The role of experimental microcosms in ecological research. Trends in Ecology & Evolution 12: 478–481.

Galatowitsch, S. M., and A. G. van der Valk. 1996. Characteristics of recently restored wetlands in the prairie pothole region. Wetlands 16:75-83.

Galatowitsch, S.M., and A.G. van der Valk. 1996. The vegetation of restored and natural prairie wetlands. Ecological Applications 6: 102-112.

Gowing, D., C. Lawson, E. Youngs, K. Barber, J. Rodwell, M. Prosser, H. Wallace, J. Mountford, and G. Spoor. 2002. The water regime requirements and the response to hydrological change of grassland plant communities: DEFRA-commissioned project BD1310. Final Report to the Department for Environment, Food and Rural Affairs. Cranfield University, Silsoe, UK.

Hood, W. G. 2013. Applying and testing a predictive model to management of the invasive cattail, Typha angustifolia L., in an oligohaline tidal marsh reveals priority effects cause by non-stationary. Wetlands Ecology Management 21: 229-242.

Reinhardt Adams, C. and Galatowitsch, S. M. 2008. The transition from invasive species control to native species promotion and its dependence on seed density thresholds. Applied Vegetation Science 11: 131–138.

Schultz, W., and G. Rave. 1999. The effect of cold stratification and light on the seed germination of temperate sedges (Carex) from various habitats and implications for regenerative strategies. Plant Ecology 144: 215-230.

Silvertown, J., M.E. Dodd, D.J.G. Gowing, and J.O. Mountford. 1999. Hydrologically defined niches reveal a basis for species richness in plant communities. Nature 400: 61–63.

van der Valk, A.G. and C. B. Davis. 1978. The role of the seed bank in the vegetation dynamics of prairie glacial marshes. Ecology 59: 322-335.

van der Valk, A.G., T.L. Bremholm, and E. Gordon. 1999. The restoration of sedge meadows: seed viability, seed germination requirements, and seedling growth of *Carex* species. Wetlands 19:756-764.

Wetzel, P. R., and A. G. van der Valk. 1998. Effects of nutrient and soil moisture on competition between shape Carex stricta, shape Phalaris arundinacea, and shape Typha latifolia. Ecology 138: 179-190.

APPENDIX A: PROCEDURE FOR FIRST STUDY

The following pages are a more detailed description of the methods of the first experiment that was presented in Chapter II.

1. The research location was at Hinds Research Farm approximately 2 km north of Ames, IA. Construction of the experiment began in 2013. The experiment ended in August 2016. Data was collected from May 2014 to August 2016.
2. A 500 m^2 area of land was leveled with heavy equipment. 80 mesocosms were arranged in 5 blocks of 16 (Figure A1). Each mesocosm was 2/3 m tall and had 1 m^2 surface area at the top.

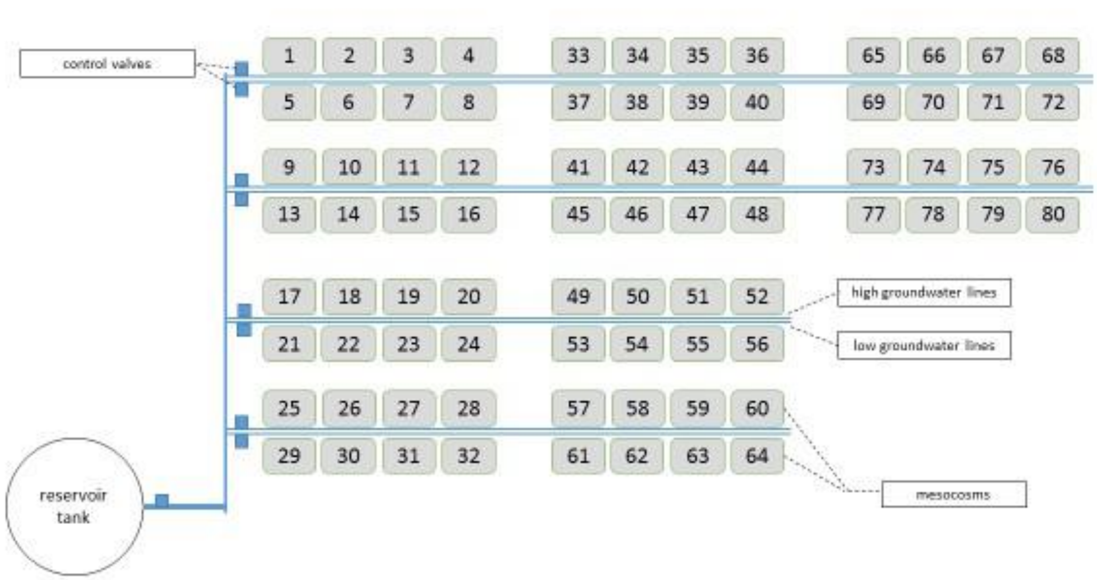

Figure A1. – Diagram of experimental layout. Mesocosms are numbered as they appear in Appendix B. Block 1 includes mesocosms 1-16. Block 2 includes mesocosms 17-32. Block 3 includes mesocosms 33-48. Block 4 includes mesocosms 49-64. Block 5 includes mesocosms 65-80. Groundwater lines are not depicted to full accuracy.

3. Between rows as shown in Figure A1, 4 water lines were constructed from PVC (Figure A2). Each line was connected to a main line, which was then connected to a 1500-gallon reservoir tank. The reservoir tank was filled with water from a well. Each mesocosm was connected to either the primary high feed or primary low feed (Figure A2) depending on which groundwater treatment it was assigned. Figure A2 describes how water was evenly distributed to all mesocosms. All high groundwater treatment mesocosms were drilled with four holes around the container 5 cm below the soil surface. All low groundwater treatment mesocosms were drilled with four holes around the container 30 cm below the soil surface.

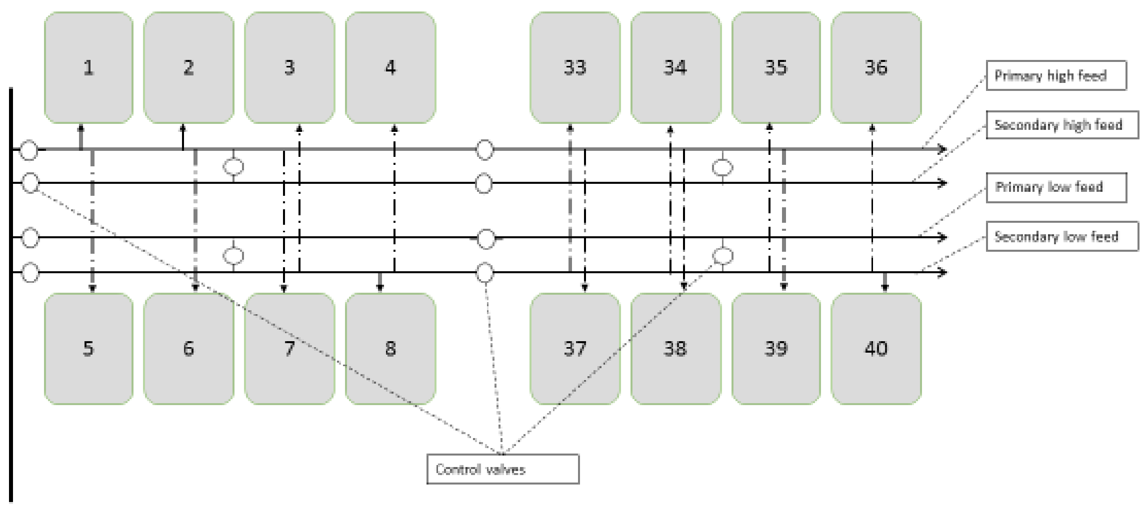

Figure A2. – Diagram depicting close-up of top-left section of Figure A1. Each mesocosm is connected to either the primary high feed or primary low feed (dashed arrows) depending on its assigned groundwater treatment. Secondary high feed and secondary low feed lines used to help facilitate flow to all mesocosms equally. Control valves were opened as needed to facilitate even distribution of water.

4. Mesocosms were filled with 5 cm of gravel. They were then filled with soil that was excavated from a wetland in northern Iowa.
5. Seeds of the following species were purchased from Prairie Moon Nursery: *Calamagrostis canadensis, Glyceria striata*, Leersia oryzoides*, Sparganium*

eurycarpum, Eleocharis palustris*, Juncus dudleyi, Scirpus tabernaemontani*, Asclepias incarnata, Aster puniceus, Eupatorium perfoliatum, Helenium autumnale*, Lobelia siphilitica, Scutellaria lateriflora*, Solidago gigantea, Cicuta maculata, Stachys palustris, Thalictrum dasycarpum, Carex cristatella, Carex hystericina, Carex molesta, Carex pellita, Carex stipata, Carex stricta, Carex tribuloides, and Carex vulpinoidea*.* Species with asterisks are aggressive species.

6. Within each block, each mesocosm was randomly assigned with 1 of the 16 possible treatment combinations. A code corresponding to that treatment combination was painted on the mesocosms. A zip-lock bag was then assigned to each mesocosm with the corresponding code. If the bag was coded as complete set, then all species were included in the bag. If the bag was coded as split-set, then the non-aggressive species and aggressive species were split into two separate bags. If the bag was coded as high density, then 34 seeds of each species were included in the bag. The number of seeds of each species was adjusted by dividing 34 by the PLS value for that species. If it was coded as low density, 17 seeds of each species were included in the bag. The number of seeds of each species was adjusted by dividing 17 by the PLS value for that species. If the bagwas coded as stratified, then the bag was filled with sand and water. If the bag was coded as not-stratified, then the bag was filled with dry sand. All sand was sterilized before use. All bags were stored in a cold-room at 4°C for 3 months.
7. In mid-May 2014, the mesocosms were seeded. Before seeding, the soil surface was scratched with a gardening tool. Each mesocosm was seeded with its corresponding bag. For those mesocosms that were assigned the split-set treatment, only the bag of seeds containing the non-aggressive species was used. In the following November, the bag of aggressive species was seeded in those mesocosms.
8. Every day, the control valve at the base of the reservoir tank was opened (Figure A1) allowing water to flow into the mesocosms. When all mesocosms were full the valve was closed.
9. During the first year, counts were made every two weeks once the plants began sprouting. Each individual plant was counted. Because the species of the plants were hard to distinguish, each plant was categorized into 1 of 3 groups: grasses, forbs, or sedges. During the last count of the first year, forbs and grasses could be speciated. However,

sedges were still lumped into a single group. Because of difficulty identifying the difference between species and between plants, the counts from the first year were not as accurate as the second and third year counts. The final count of the first year was used for the analysis. The date of that count was August 15, 2014.

10. During the second year, counts were made every two weeks once the majority of the plants were green. Each individual plant was counted. The number of plants of each species in each mesocosm was counted. A total of 5 counts were made. The fourth count contained the highest plant density and was used for analysis. The date of the fourth count was August 12, 2015.
11. During the third year, counts were made every two weeks once the majority of the plants were green. Each individual plant was counted. The number of plants of each species in each mesocosm was counted. A total of 5 counts were made. The fourth count contained the highest plant density and was used for analysis. The date of the fourth count was August 12, 2016.
12. On August 18, 2016, all plants were harvested. Plants were cut with shears at the soil surface. For each mesocosm, each species was separated into paper bags and labeled.
13. The paper bags were dried in ovens at 60°C for 24 hours. The bags were then weighed. Plants were emptied from the bag and the mass of the empty bag was subtracted from the total mass.
14. ANOVA analysis was performed on each species group (grass, forb, sedge) and each individual species for the count and biomass data using R-platform. ANOVA tables can be found in Appendix B.

APPENDIX B: ANOVA TABLES

This appendix presents the ANOVA tables outputted for R-statistical software. Study One (presented in Chapter II) is divided into four sections based: ANOVA tables for each (3) year of count data and the biomass data. In the Study One ANOVA tables, split-set, low groundwater level, stratified seed, and low seed density are the base levels of comparison. In the Study Two ANOVA tables, groundwater level is presented as a linear regression coefficient. The first seeding date (June 16) is the base level of comparison for the seeding date treatment. Each new ANOVA table begins with "Call:".

Study One

Year 1 (2014)

```
Call:
lm(formula = grasses ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-8.8000 -3.6594 -0.1125  2.3281 17.1250

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  13.8500     1.7363   7.977 1.43e-11 ***
block         0.5125     0.3983   1.287  0.20225
setS         -7.7750     1.1267  -6.901 1.50e-09 ***
waterL       -6.7250     1.1267  -5.969 7.64e-08 ***
stratifiedS   2.9750     1.1267   2.641  0.01009 *
densityL     -3.0750     1.1267  -2.729  0.00793 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 5.039 on 74 degrees of freedom
Multiple R-squared:  0.5731,     Adjusted R-squared:  0.5442
F-statistic: 19.87 on 5 and 74 DF,  p-value: 1.675e-12
```

```
Call:
lm(formula = sedges ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-23.7688  -5.5187   0.8937   6.8641  21.6187

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  21.1938     3.2043   6.614 5.11e-09 ***
block         2.3687     0.7351   3.222 0.001892 **
setS          2.7000     2.0792   1.299 0.198125
waterL      -13.6500     2.0792  -6.565 6.29e-09 ***
stratifiedS   4.4500     2.0792   2.140 0.035632 *
densityL     -8.3500     2.0792  -4.016 0.000141 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 9.299 on 74 degrees of freedom
Multiple R-squared:  0.5063,     Adjusted R-squared:  0.4729
F-statistic: 15.18 on 5 and 74 DF,  p-value: 3.04e-10


Call:

lm(formula = forbs ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-36.225  -6.200   0.375   6.938  30.125

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  31.1750     3.8524   8.092 8.66e-12 ***
block         2.6750     0.8838   3.027   0.0034 **
setS        -13.6000     2.4998  -5.441 6.58e-07 ***
waterL       -3.8000     2.4998  -1.520   0.1327
stratifiedS  11.7500     2.4998   4.700 1.17e-05 ***
densityL    -13.4000     2.4998  -5.361 9.05e-07 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 11.18 on 74 degrees of freedom
Multiple R-squared:  0.5539,     Adjusted R-squared:  0.5238
F-statistic: 18.38 on 5 and 74 DF,  p-value: 8.061e-12


Call:
lm(formula = total ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-68.79 -11.91   2.45  14.12  43.49

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   66.219      7.325   9.041 1.39e-13 ***
block          5.556      1.680   3.307 0.001459 **
setS         -18.675      4.753  -3.929 0.000190 ***
waterL       -24.175      4.753  -5.086 2.67e-06 ***
stratifiedS   19.175      4.753   4.034 0.000132 ***
densityL     -24.825      4.753  -5.223 1.56e-06 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 21.26 on 74 degrees of freedom
Multiple R-squared:  0.5642,     Adjusted R-squared:  0.5348
F-statistic: 19.16 on 5 and 74 DF,  p-value: 3.501e-12
```

```
Call:
lm(formula = simpson ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-12.2448  -3.7725  -0.5636   2.7321  15.2309

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  16.2064     1.6853   9.617 1.15e-14 ***
block         0.2713     0.3866   0.702    0.485
setS          1.3836     1.0935   1.265    0.210
waterL       -7.8494     1.0935  -7.178 4.57e-10 ***
stratifiedS   0.2649     1.0935   0.242    0.809
densityL      0.2883     1.0935   0.264    0.793
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 4.89 on 74 degrees of freedom
Multiple R-squared:  0.4207,     Adjusted R-squared:  0.3816
F-statistic: 10.75 on 5 and 74 DF,  p-value: 8.641e-08


Call:
lm(formula = calamagrostis.canadensis ~ block + stratified +
    water + set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.3625 -0.9531 -0.0562  0.9750  3.9625

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.4000     0.5045   4.757 9.47e-06 ***
block         0.0125     0.1157   0.108  0.91429
stratifiedS  -0.4250     0.3274  -1.298  0.19824
waterL       -0.4750     0.3274  -1.451  0.15102
setS          0.9250     0.3274   2.826  0.00606 **
densityL     -0.9250     0.3274  -2.826  0.00606 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.464 on 74 degrees of freedom
Multiple R-squared:  0.2108,     Adjusted R-squared:  0.1575
F-statistic: 3.954 on 5 and 74 DF,  p-value: 0.003118


Call:
lm(formula = glyceria.striata ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.6750 -1.0500 -0.1062  1.0375  6.5625

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   4.0375     0.5792   6.971 1.11e-09 ***
block         0.2125     0.1329   1.599    0.114
stratifiedS   0.5500     0.3758   1.464    0.148
waterL       -1.7000     0.3758  -4.524 2.27e-05 ***
setS         -3.8500     0.3758 -10.245 7.73e-16 ***
densityL     -0.5000     0.3758  -1.330    0.187
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.681 on 74 degrees of freedom
Multiple R-squared:  0.6406,     Adjusted R-squared:  0.6163
F-statistic: 26.38 on 5 and 74 DF,  p-value: 3.368e-15
```

```
Call:
lm(formula = leersia.oryzoides ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-4.0375 -1.3500 -0.3313  1.0125  8.0125

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.9875     0.7231   5.515 4.89e-07 ***
block         0.0125     0.1659   0.075 0.940138
stratifiedS   1.9500     0.4692   4.156 8.60e-05 ***
waterL       -1.6500     0.4692  -3.517 0.000751 ***
setS         -3.7000     0.4692  -7.886 2.13e-11 ***
densityL     -0.9500     0.4692  -2.025 0.046506 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.098 on 74 degrees of freedom
Multiple R-squared:  0.5645,     Adjusted R-squared:  0.5351
F-statistic: 19.19 on 5 and 74 DF,  p-value: 3.41e-12


Call:
lm(formula = juncus.dudleyi ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.1000 -0.8234 -0.2500  1.0359  4.1313

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.7062     0.5283   5.122 2.32e-06 ***
block         0.1313     0.1212   1.083    0.282
stratifiedS  -0.0500     0.3428  -0.146    0.884
waterL       -2.0000     0.3428  -5.834 1.33e-07 ***
setS         -0.1000     0.3428  -0.292    0.771
densityL     -0.5500     0.3428  -1.604    0.113
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.533 on 74 degrees of freedom
Multiple R-squared:  0.3386,     Adjusted R-squared:  0.2939
F-statistic: 7.577 on 5 and 74 DF,  p-value: 8.603e-06


Call:
lm(formula = scirpus.tabernaemontani ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-1.3250 -0.7625 -0.1437  0.2500  4.8000

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.74375    0.37037   2.008 0.048280 *
block        0.13125    0.08497   1.545 0.126689
stratifiedS  0.87500    0.24033   3.641 0.000501 ***
waterL      -0.92500    0.24033  -3.849 0.000250 ***
setS        -1.07500    0.24033  -4.473 2.74e-05 ***
densityL    -0.07500    0.24033  -0.312 0.755862
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.075 on 74 degrees of freedom
Multiple R-squared:  0.4059,     Adjusted R-squared:  0.3658
F-statistic: 10.11 on 5 and 74 DF,  p-value: 2.09e-07
```

```
Call:
lm(formula = asclepias.incarnata ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max 
-8.688 -2.425 -0.025  2.294  9.137 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   5.2375     1.3500   3.880 0.000225 ***
block         0.7250     0.3097   2.341 0.021936 *  
stratifiedS   4.7250     0.8760   5.394 7.93e-07 ***
waterL       -1.7750     0.8760  -2.026 0.046345 *  
setS          0.9250     0.8760   1.056 0.294437    
densityL     -3.9750     0.8760  -4.538 2.16e-05 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 3.918 on 74 degrees of freedom
Multiple R-squared:  0.4493,     Adjusted R-squared:  0.4121 
F-statistic: 12.08 on 5 and 74 DF,  p-value: 1.455e-08


Call:
lm(formula = aster.puniceus ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max 
-5.287 -2.131 -0.125  1.700  7.037 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   2.4625     1.0433   2.360 0.020893 *  
block         0.9750     0.2393   4.074 0.000115 ***
stratifiedS   0.7750     0.6770   1.145 0.255968    
waterL        0.8250     0.6770   1.219 0.226832    
setS          1.6250     0.6770   2.400 0.018890 *  
densityL     -2.3250     0.6770  -3.434 0.000976 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 3.027 on 74 degrees of freedom
Multiple R-squared:  0.333,      Adjusted R-squared:  0.288 
F-statistic:  7.39 on 5 and 74 DF,  p-value: 1.148e-05


Call:
lm(formula = eupatorium.perfoliatum ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.7750 -1.2047 -0.2062  1.1531  5.3375 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   0.9188     0.6904   1.331  0.18733    
block         0.5188     0.1584   3.275  0.00161 ** 
stratifiedS   1.9500     0.4480   4.353 4.24e-05 ***
waterL       -0.8000     0.4480  -1.786  0.07822 .  
setS          0.3500     0.4480   0.781  0.43711    
densityL     -1.3500     0.4480  -3.014  0.00353 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 2.003 on 74 degrees of freedom
Multiple R-squared:  0.3651,     Adjusted R-squared:  0.3222 
F-statistic: 8.512 on 5 and 74 DF,  p-value: 2.103e-06
```

```
Call:
lm(formula = helenium.autumnale ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-6.7250 -1.5344 -0.1938  1.2375  9.6750

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   7.5750     0.9716   7.796 3.14e-11 ***
block         0.1875     0.2229   0.841  0.40297
stratifiedS   0.4250     0.6305   0.674  0.50236
waterL        0.2750     0.6305   0.436  0.66398
setS         -7.3250     0.6305 -11.618  < 2e-16 ***
densityL     -2.0250     0.6305  -3.212  0.00195 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.82 on 74 degrees of freedom
Multiple R-squared:  0.6646,     Adjusted R-squared:  0.642
F-statistic: 29.33 on 5 and 74 DF,  p-value: 2.738e-16


Call:
lm(formula = lobelia.siphilitica ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-0.63750 -0.23750 -0.18125  0.01563  2.58750

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.07500    0.19671   0.381   0.7041
block       -0.01250    0.04513  -0.277   0.7826
stratifiedS -0.22500    0.12764  -1.763   0.0821 .
waterL       0.17500    0.12764   1.371   0.1745
setS         0.22500    0.12764   1.763   0.0821 .
densityL     0.17500    0.12764   1.371   0.1745
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.5708 on 74 degrees of freedom
Multiple R-squared:  0.1196,     Adjusted R-squared:  0.06009
F-statistic:  2.01 on 5 and 74 DF,  p-value: 0.08701


Call:
lm(formula = scutellaria.lateriflora ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.9250 -0.9406 -0.2938  0.9516  4.4625

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.8938     0.5530   5.233  1.5e-06 ***
block        -0.2187     0.1269  -1.724   0.0888 .
stratifiedS   0.9750     0.3588   2.717   0.0082 **
waterL       -0.7250     0.3588  -2.020   0.0470 *
setS         -0.1750     0.3588  -0.488   0.6272
densityL     -0.9750     0.3588  -2.717   0.0082 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.605 on 74 degrees of freedom
Multiple R-squared:  0.2296,     Adjusted R-squared:  0.1776
F-statistic: 4.411 on 5 and 74 DF,  p-value: 0.001432
```

```
Call:
lm(formula = solidago.gigantea ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-10.800  -1.200   0.050   1.387   7.600 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   9.5000     1.0715   8.866 2.97e-13 ***
block         0.1500     0.2458   0.610   0.5436    
stratifiedS  -0.7500     0.6953  -1.079   0.2842    
waterL        1.1500     0.6953   1.654   0.1023    
setS         -9.4500     0.6953 -13.592  < 2e-16 ***
densityL     -1.4000     0.6953  -2.014   0.0477 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 3.109 on 74 degrees of freedom
Multiple R-squared:  0.7229,     Adjusted R-squared:  0.7042 
F-statistic: 38.61 on 5 and 74 DF,  p-value: < 2.2e-16


Call:
lm(formula = cicuta.maculata ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-5.9563 -1.3250  0.2906  1.5141  5.5125 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   1.1813     0.7566   1.561  0.12271    
block         0.5312     0.1736   3.061  0.00308 ** 
stratifiedS   4.1000     0.4909   8.352 2.80e-12 ***
waterL       -2.7000     0.4909  -5.500 5.18e-07 ***
setS          0.5500     0.4909   1.120  0.26620    
densityL     -1.4500     0.4909  -2.954  0.00421 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 2.195 on 74 degrees of freedom
Multiple R-squared:  0.6173,     Adjusted R-squared:  0.5914 
F-statistic: 23.87 on 5 and 74 DF,  p-value: 3.266e-14


Call:
lm(formula = stachys.palustris ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-0.9688 -0.5250 -0.2219  0.1766  3.8500 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)  1.33125    0.30239   4.402 3.54e-05 ***
block       -0.18125    0.06937  -2.613   0.0109 *  
stratifiedS -0.22500    0.19622  -1.147   0.2552    
waterL      -0.22500    0.19622  -1.147   0.2552    
setS        -0.32500    0.19622  -1.656   0.1019    
densityL    -0.07500    0.19622  -0.382   0.7034    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 0.8775 on 74 degrees of freedom
Multiple R-squared:  0.143,      Adjusted R-squared:  0.08507 
F-statistic: 2.469 on 5 and 74 DF,  p-value: 0.04
```

Year 2 (2015)

```
Call:
lm(formula = grasses ~ block + set + water + stratified + density, 
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-8.7500 -2.8094 -0.5125  1.8469 13.2000 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)  10.8500     1.3630   7.961 1.54e-11 ***
block         0.3625     0.3127   1.159    0.250    
setS         -4.7750     0.8844  -5.399 7.76e-07 ***
waterL       -6.8750     0.8844  -7.774 3.47e-11 ***
stratifiedS   1.2250     0.8844   1.385    0.170    
densityL     -0.7250     0.8844  -0.820    0.415    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 3.955 on 74 degrees of freedom
Multiple R-squared:  0.5582,	Adjusted R-squared:  0.5284 
F-statistic:  18.7 on 5 and 74 DF,  p-value: 5.698e-12


Call:
lm(formula = sedges ~ block + set + water + stratified + density, 
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max 
-14.6125  -4.8562   0.0812   4.4844  12.7875 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)  16.0625     2.1704   7.401 1.75e-10 ***
block         0.7625     0.4979   1.531   0.1300    
setS          3.2500     1.4084   2.308   0.0238 *  
waterL       -8.0500     1.4084  -5.716 2.16e-07 ***
stratifiedS   0.8500     1.4084   0.604   0.5480    
densityL     -3.3500     1.4084  -2.379   0.0200 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 6.298 on 74 degrees of freedom
Multiple R-squared:  0.3852,	Adjusted R-squared:  0.3437 
F-statistic: 9.273 on 5 and 74 DF,  p-value: 6.905e-07
```

```
Call:
lm(formula = forbs ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-16.0187  -3.9828   0.4344   3.8500  14.3250

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  25.2438     2.4820  10.171 1.06e-15 ***
block         0.4562     0.5694   0.801 0.425534
setS         -6.0250     1.6105  -3.741 0.000359 ***
waterL       -3.6250     1.6105  -2.251 0.027366 *
stratifiedS   4.1750     1.6105   2.592 0.011480 *
densityL     -5.2250     1.6105  -3.244 0.001768 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 7.202 on 74 degrees of freedom
Multiple R-squared:  0.333,     Adjusted R-squared:  0.288
F-statistic:  7.39 on 5 and 74 DF,  p-value: 1.148e-05


Call:
lm(formula = total ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-29.431  -6.558  -0.050   8.806  31.431

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  52.1563     4.2753  12.199  < 2e-16 ***
block         1.5812     0.9808   1.612  0.11118
setS         -7.5500     2.7742  -2.722  0.00810 **
waterL      -18.5500     2.7742  -6.687 3.75e-09 ***
stratifiedS   6.2500     2.7742   2.253  0.02723 *
densityL     -9.3000     2.7742  -3.352  0.00127 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 12.41 on 74 degrees of freedom
Multiple R-squared:  0.4898,    Adjusted R-squared:  0.4553
F-statistic: 14.21 on 5 and 74 DF,  p-value: 9.786e-10


Call:
lm(formula = simpson ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.7164 -0.8489  0.0454  1.1312  3.8519

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   9.4615     0.5241  18.052  < 2e-16 ***
block         0.2164     0.1202   1.800  0.07593 .
setS         -1.4356     0.3401  -4.221 6.82e-05 ***
waterL       -2.3156     0.3401  -6.809 2.23e-09 ***
stratifiedS   0.9852     0.3401   2.897  0.00495 **
densityL     -0.8360     0.3401  -2.458  0.01631 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.521 on 74 degrees of freedom
Multiple R-squared:  0.5252,    Adjusted R-squared:  0.4931
F-statistic: 16.37 on 5 and 74 DF,  p-value: 7.535e-11
```

```
Call:
lm(formula = richness ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-5.7485 -1.1264  0.2543  1.2218  4.4631

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  13.1050     0.7059  18.564  < 2e-16 ***
block         0.3616     0.1633   2.215   0.0298 *
setS         -2.2268     0.4617  -4.823 7.36e-06 ***
waterL       -2.7232     0.4617  -5.899 1.02e-07 ***
stratifiedS   1.1268     0.4617   2.441   0.0171 *
densityL     -0.9297     0.4624  -2.011   0.0480 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.064 on 74 degrees of freedom
Multiple R-squared:  0.4961,     Adjusted R-squared:  0.462
F-statistic: 14.57 on 5 and 74 DF,  p-value: 6.284e-10
```

```
Call:
lm(formula = calamagrostis.canadensis ~ block + stratified +
    water + set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.1500 -1.0203 -0.2719  0.7563  4.9375

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.6187     0.4931   3.283  0.00157 **
block        -0.1562     0.1131  -1.381  0.17133
stratifiedS  -0.4500     0.3199  -1.407  0.16376
waterL       -0.3500     0.3199  -1.094  0.27752
setS          1.0000     0.3199   3.126  0.00254 **
densityL      0.0500     0.3199   0.156  0.87624
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.431 on 74 degrees of freedom
Multiple R-squared:  0.1674,     Adjusted R-squared:  0.1111
F-statistic: 2.975 on 5 and 74 DF,  p-value: 0.01676
```

```
Call:
lm(formula = glyceria.striata ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.3312 -0.7094 -0.3813  0.5750  4.6437

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.4188     0.4596   5.263 1.33e-06 ***
block         0.1062     0.1054   1.008 0.316889
stratifiedS  -0.2750     0.2982  -0.922 0.359466
waterL       -1.2250     0.2982  -4.108 0.000102 ***
setS         -1.9750     0.2982  -6.622 4.93e-09 ***
densityL     -0.0250     0.2982  -0.084 0.933419
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.334 on 74 degrees of freedom
Multiple R-squared:  0.4583,     Adjusted R-squared:  0.4217
F-statistic: 12.52 on 5 and 74 DF,  p-value: 8.161e-09
```

```
Call:
lm(formula = leersia.oryzoides ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.8875 -1.2437 -0.1281  1.0219  5.3875

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.7812     0.6247   4.452 2.96e-05 ***
block         0.1562     0.1433   1.090   0.2791
stratifiedS   0.9500     0.4054   2.344   0.0218 *
waterL       -1.8000     0.4054  -4.440 3.08e-05 ***
setS         -2.3000     0.4054  -5.674 2.56e-07 ***
densityL      0.1000     0.4054   0.247   0.8058
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.813 on 74 degrees of freedom
Multiple R-squared:  0.4422,     Adjusted R-squared:  0.4045
F-statistic: 11.73 on 5 and 74 DF,  p-value: 2.297e-08


Call:
lm(formula = juncus.dudleyi ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.7750 -0.6719 -0.2938  0.4750  4.8625

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.688e+00  4.669e-01   5.756 1.83e-07 ***
block        1.125e-01  1.071e-01   1.050    0.297
stratifiedS -4.000e-01  3.029e-01  -1.320    0.191
waterL      -2.150e+00  3.029e-01  -7.097 6.48e-10 ***
setS        -4.406e-16  3.029e-01   0.000    1.000
densityL    -2.500e-01  3.029e-01  -0.825    0.412
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.355 on 74 degrees of freedom
Multiple R-squared:  0.4214,     Adjusted R-squared:  0.3823
F-statistic: 10.78 on 5 and 74 DF,  p-value: 8.289e-08


Call:
lm(formula = scirpus.tabernaemontani ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.8875 -1.2594 -0.2844  0.4641  8.9688

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.3438     0.7319   1.836  0.07039 .
block         0.1438     0.1679   0.856  0.39472
stratifiedS   1.4000     0.4749   2.948  0.00428 **
waterL       -1.3500     0.4749  -2.842  0.00578 **
setS         -1.5000     0.4749  -3.158  0.00230 **
densityL     -0.6000     0.4749  -1.263  0.21044
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.124 on 74 degrees of freedom
Multiple R-squared:  0.2821,     Adjusted R-squared:  0.2335
F-statistic: 5.814 on 5 and 74 DF,  p-value: 0.0001393
```

```
Call:
lm(formula = asclepias.incarnata ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.2500 -1.0156 -0.2562  0.8250  3.6125

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.3500     0.4407   3.063  0.00305 **
block        -0.0125     0.1011  -0.124  0.90193
stratifiedS   0.8250     0.2859   2.885  0.00512 **
waterL       -0.2750     0.2859  -0.962  0.33932
setS          0.3750     0.2859   1.311  0.19377
densityL     -0.2750     0.2859  -0.962  0.33932
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.279 on 74 degrees of freedom
Multiple R-squared:  0.1386,     Adjusted R-squared:  0.08042
F-statistic: 2.382 on 5 and 74 DF,  p-value: 0.04643


Call:
lm(formula = aster.puniceus ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-4.263 -2.075 -0.100  1.694  5.013

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.9125     0.7921   4.940 4.71e-06 ***
block         0.0750     0.1817   0.413   0.6810
stratifiedS  -0.0250     0.5140  -0.049   0.9613
waterL        0.0250     0.5140   0.049   0.9613
setS          2.1250     0.5140   4.135 9.28e-05 ***
densityL     -1.0250     0.5140  -1.994   0.0498 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.298 on 74 degrees of freedom
Multiple R-squared:  0.2231,     Adjusted R-squared:  0.1706
F-statistic:  4.25 on 5 and 74 DF,  p-value: 0.001884


Call:
lm(formula = eupatorium.perfoliatum ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.8750 -1.1188 -0.3812  1.0359  5.1937

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.4813     0.6115   2.422  0.01786 *
block         0.1813     0.1403   1.292  0.20036
stratifiedS   1.1500     0.3968   2.898  0.00493 **
waterL       -0.5500     0.3968  -1.386  0.16985
setS          0.7000     0.3968   1.764  0.08182 .
densityL     -1.1000     0.3968  -2.772  0.00704 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.774 on 74 degrees of freedom
Multiple R-squared:  0.2355,     Adjusted R-squared:  0.1838
F-statistic: 4.558 on 5 and 74 DF,  p-value: 0.001118
```

```
Call:
lm(formula = helenium.autumnale ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-5.675 -0.925 -0.175  0.475  6.075

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  7.025e+00  7.191e-01   9.769 5.95e-15 ***
block       -4.452e-16  1.650e-01   0.000    1.000
stratifiedS  6.500e-01  4.666e-01   1.393    0.168
waterL       8.068e-17  4.666e-01   0.000    1.000
setS        -6.750e+00  4.666e-01 -14.466  < 2e-16 ***
densityL    -7.500e-01  4.666e-01  -1.607  0.112
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.087 on 74 degrees of freedom
Multiple R-squared:  0.7429,     Adjusted R-squared:  0.7255
F-statistic: 42.76 on 5 and 74 DF,  p-value: < 2.2e-16


Call:
lm(formula = lobelia.siphilitica ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-4.9000 -1.7516 -0.5094  1.3562  6.3688

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.5438     0.8774   2.899  0.00492 **
block         0.4687     0.2013   2.329  0.02261 *
stratifiedS   0.1500     0.5693   0.263  0.79293
waterL       -1.6000     0.5693  -2.810  0.00633 **
setS          1.8000     0.5693   3.162  0.00228 **
densityL     -1.1000     0.5693  -1.932  0.05718 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.546 on 74 degrees of freedom
Multiple R-squared:  0.2682,     Adjusted R-squared:  0.2187
F-statistic: 5.424 on 5 and 74 DF,  p-value: 0.0002641


Call:
lm(formula = scutellaria.lateriflora ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-0.2625 -0.1125 -0.0500  0.0125  1.7625

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.16250    0.09843   1.651   0.1030
block       -0.05000    0.02258  -2.214   0.0299 *
stratifiedS  0.07500    0.06387   1.174   0.2441
waterL      -0.02500    0.06387  -0.391   0.6966
setS         0.07500    0.06387   1.174   0.2441
densityL    -0.02500    0.06387  -0.391   0.6966
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2856 on 74 degrees of freedom
Multiple R-squared:  0.0972,     Adjusted R-squared:  0.0362
F-statistic: 1.593 on 5 and 74 DF,  p-value: 0.1725
```

```
Call:
lm(formula = solidago.gigantea ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.8375 -1.3313 -0.0937  1.2313  7.6125 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   6.5938     0.8225   8.017 1.20e-11 ***
block        -0.2563     0.1887  -1.358   0.1786    
stratifiedS  -1.3000     0.5337  -2.436   0.0173 *  
waterL        1.2500     0.5337   2.342   0.0219 *  
setS         -5.4500     0.5337 -10.212 8.89e-16 ***
densityL     -0.2000     0.5337  -0.375   0.7089    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 2.387 on 74 degrees of freedom
Multiple R-squared:  0.614,	Adjusted R-squared:  0.5879 
F-statistic: 23.54 on 5 and 74 DF,  p-value: 4.456e-14 


Call:
lm(formula = cicuta.maculata ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max 
-4.050 -1.100  0.050  0.775  4.900 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   0.7000     0.6094   1.149   0.2544    
block         0.2500     0.1398   1.788   0.0778 .  
stratifiedS   3.2000     0.3954   8.093 8.65e-12 ***
waterL       -1.9500     0.3954  -4.932 4.86e-06 ***
setS          0.9500     0.3954   2.403   0.0188 *  
densityL     -0.8500     0.3954  -2.150   0.0349 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 1.768 on 74 degrees of freedom
Multiple R-squared:  0.5829,	Adjusted R-squared:  0.5547 
F-statistic: 20.68 on 5 and 74 DF,  p-value: 7.256e-13 


Call:
lm(formula = stachys.palustris ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-1.5250 -0.6875 -0.2750  0.1250  8.5750 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)   
(Intercept)   1.4750     0.5096   2.894  0.00499 **
block        -0.2000     0.1169  -1.711  0.09134 . 
stratifiedS  -0.5500     0.3307  -1.663  0.10051   
waterL       -0.5000     0.3307  -1.512  0.13480   
setS          0.1500     0.3307   0.454  0.65145   
densityL      0.1000     0.3307   0.302  0.76320   
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 1.479 on 74 degrees of freedom
Multiple R-squared:  0.1006,	Adjusted R-squared:  0.03981 
F-statistic: 1.655 on 5 and 74 DF,  p-value: 0.1562 
```

```
Call:
lm(formula = carex.cristatella ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-1.5875 -0.7672 -0.2281  0.6469  3.0812

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.95625    0.35593   2.687  0.00891 **
block        0.10625    0.08166   1.301  0.19722
stratifiedS -0.30000    0.23096  -1.299  0.19799
waterL      -0.35000    0.23096  -1.515  0.13392
setS         0.70000    0.23096   3.031  0.00336 **
densityL    -0.60000    0.23096  -2.598  0.01131 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.033 on 74 degrees of freedom
Multiple R-squared:  0.226,      Adjusted R-squared:  0.1737
F-statistic: 4.322 on 5 and 74 DF,  p-value: 0.001665


Call:
lm(formula = carex.hystericina ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-1.775 -0.675  0.025  0.375  2.300

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.70000    0.32826   2.132  0.03629 *
block        0.07500    0.07531   0.996  0.32255
stratifiedS  0.15000    0.21301   0.704  0.48352
waterL      -0.95000    0.21301  -4.460 2.87e-05 ***
setS         0.70000    0.21301   3.286  0.00155 **
densityL    -0.15000    0.21301  -0.704  0.48352
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9526 on 74 degrees of freedom
Multiple R-squared:  0.3063,     Adjusted R-squared:  0.2594
F-statistic: 6.535 on 5 and 74 DF,  p-value: 4.375e-05


Call:
lm(formula = carex.molesta ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-3.737 -1.256 -0.250  1.534  4.800

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.4000     0.6569   5.176 1.88e-06 ***
block         0.0125     0.1507   0.083 0.934121
stratifiedS  -0.1750     0.4263  -0.411 0.682591
waterL       -1.6250     0.4263  -3.812 0.000283 ***
setS          0.6750     0.4263   1.584 0.117563
densityL     -0.2250     0.4263  -0.528 0.599185
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.906 on 74 degrees of freedom
Multiple R-squared:  0.1912,     Adjusted R-squared:  0.1366
F-statistic: 3.499 on 5 and 74 DF,  p-value: 0.006804
```

```
Call:
lm(formula = carex.stipata ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.9750 -1.6032 -0.2186  1.6250  7.0487 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   3.5732     0.8200   4.358 4.23e-05 ***
block         0.1891     0.1861   1.016  0.31294    
stratifiedS   0.8564     0.5281   1.622  0.10921    
waterL       -2.4936     0.5281  -4.722 1.10e-05 ***
setS          1.4564     0.5281   2.758  0.00735 ** 
densityL     -0.8936     0.5281  -1.692  0.09489 .  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 2.346 on 73 degrees of freedom
  (1 observation deleted due to missingness)
Multiple R-squared:  0.3357,     Adjusted R-squared:  0.2902 
F-statistic: 7.377 on 5 and 73 DF,  p-value: 1.207e-05 


Call:
lm(formula = carex.tribuloides ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max 
-5.275 -2.150  0.075  1.456  5.800 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   3.4500     0.9994   3.452 0.000923 ***
block         0.3250     0.2293   1.418 0.160516    
stratifiedS   0.6000     0.6485   0.925 0.357837    
waterL       -2.0500     0.6485  -3.161 0.002277 ** 
setS          2.9000     0.6485   4.472 2.75e-05 ***
densityL     -0.7500     0.6485  -1.157 0.251165    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 2.9 on 74 degrees of freedom
Multiple R-squared:  0.3161,     Adjusted R-squared:  0.2698 
F-statistic: 6.839 on 5 and 74 DF,  p-value: 2.705e-05 


Call:
lm(formula = carex.vulpinoidea ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-3.3750 -0.6750  0.0750  0.7875  5.1250 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   3.8000     0.4995   7.608 7.11e-11 ***
block         0.0750     0.1146   0.655   0.5148    
stratifiedS  -0.2000     0.3241  -0.617   0.5391    
waterL       -0.5000     0.3241  -1.543   0.1271    
setS         -3.1000     0.3241  -9.565 1.43e-14 ***
densityL     -0.6500     0.3241  -2.006   0.0486 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 1.449 on 74 degrees of freedom
Multiple R-squared:  0.5715,     Adjusted R-squared:  0.5426 
F-statistic: 19.74 on 5 and 74 DF,  p-value: 1.905e-12
```

Year 3 (2016)

```
Call:
lm(formula = grasses ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-10.3000  -5.2188  -0.9375   3.7609  15.2375

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 16.23125    2.17455   7.464 1.33e-10 ***
block       -0.04375    0.49887  -0.088 0.930354
setS        -3.00000    1.41103  -2.126 0.036830 *
waterL      -5.55000    1.41103  -3.933 0.000187 ***
stratifiedS -0.25000    1.41103  -0.177 0.859855
densityL    -1.15000    1.41103  -0.815 0.417684
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 6.31 on 74 degrees of freedom
Multiple R-squared:  0.2185,     Adjusted R-squared:  0.1657
F-statistic: 4.139 on 5 and 74 DF,  p-value: 0.002274


Call:
lm(formula = sedges ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-14.4437  -5.1953   0.0812   4.1813  19.0437

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  19.4188     2.5089   7.740 4.01e-11 ***
block         0.5937     0.5756   1.032  0.30563
setS          2.1000     1.6280   1.290  0.20109
waterL       -8.1500     1.6280  -5.006 3.65e-06 ***
stratifiedS   3.4000     1.6280   2.088  0.04020 *
densityL     -4.7500     1.6280  -2.918  0.00467 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 7.281 on 74 degrees of freedom
Multiple R-squared:  0.3546,     Adjusted R-squared:  0.311
F-statistic: 8.133 on 5 and 74 DF,  p-value: 3.702e-06
```

```
Call:
lm(formula = forbs ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-18.3875  -5.1938  -0.0625   4.3750  16.2875

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  31.6875     2.6965  11.751  < 2e-16 ***
block         0.5750     0.6186   0.929  0.35566
setS         -7.8250     1.7497  -4.472 2.75e-05 ***
waterL       -5.4250     1.7497  -3.101  0.00273 **
stratifiedS   5.1250     1.7497   2.929  0.00452 **
densityL     -5.7250     1.7497  -3.272  0.00162 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 7.825 on 74 degrees of freedom
Multiple R-squared:  0.4021,     Adjusted R-squared:  0.3617
F-statistic: 9.952 on 5 and 74 DF,  p-value: 2.617e-07


Call:
lm(formula = total ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-31.337  -9.275   2.462   9.237  41.988

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   67.338      4.982  13.515  < 2e-16 ***
block          1.125      1.143   0.984 0.328214
setS          -8.725      3.233  -2.699 0.008618 **
waterL       -19.125      3.233  -5.916 9.53e-08 ***
stratifiedS    8.275      3.233   2.560 0.012522 *
densityL     -11.625      3.233  -3.596 0.000581 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 14.46 on 74 degrees of freedom
Multiple R-squared:  0.4588,     Adjusted R-squared:  0.4222
F-statistic: 12.55 on 5 and 74 DF,  p-value: 7.903e-09


Call:
lm(formula = simpson ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-5.5926 -1.4366 -0.0611  1.2626  5.1244

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   8.5234     0.7050  12.089  < 2e-16 ***
block         0.5050     0.1617   3.122 0.002560 **
setS         -1.0309     0.4575  -2.253 0.027197 *
waterL       -2.8379     0.4575  -6.203 2.89e-08 ***
stratifiedS   1.6945     0.4575   3.704 0.000407 ***
densityL     -0.6808     0.4575  -1.488 0.140992
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.046 on 74 degrees of freedom
Multiple R-squared:  0.4834,     Adjusted R-squared:  0.4485
F-statistic: 13.85 on 5 and 74 DF,  p-value: 1.521e-09
```

```
Call:
lm(formula = richness ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-7.0500 -1.5078  0.0781  1.8359  5.2500

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  13.3063     0.8157  16.314  < 2e-16 ***
block         0.5187     0.1871   2.772 0.007039 **
setS         -2.0750     0.5293  -3.921 0.000196 ***
waterL       -2.7750     0.5293  -5.243 1.44e-06 ***
stratifiedS   1.6750     0.5293   3.165 0.002253 **
densityL     -1.2250     0.5293  -2.315 0.023416 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.367 on 74 degrees of freedom
Multiple R-squared:  0.4711,     Adjusted R-squared:  0.4354
F-statistic: 13.18 on 5 and 74 DF,  p-value: 3.493e-09


Call:
lm(formula = calamagrostis.canadensis ~ block + stratified +
    water + set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-7.6125 -3.0625 -0.7312  2.6531  9.8750

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   6.2250     1.4862   4.189 7.66e-05 ***
block        -0.4125     0.3410  -1.210  0.23019
stratifiedS  -2.8250     0.9644  -2.929  0.00451 **
waterL        0.9750     0.9644   1.011  0.31530
setS          2.5750     0.9644   2.670  0.00932 **
densityL     -0.9250     0.9644  -0.959  0.34059
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 4.313 on 74 degrees of freedom
Multiple R-squared:  0.2053,     Adjusted R-squared:  0.1516
F-statistic: 3.823 on 5 and 74 DF,  p-value: 0.003898


Call:
lm(formula = glyceria.striata ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.2125 -0.8500 -0.0250  0.5688  6.0125

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.9375     0.5454   5.386 8.17e-07 ***
block         0.0750     0.1251   0.599   0.5507
stratifiedS   0.0750     0.3539   0.212   0.8327
waterL       -1.1750     0.3539  -3.320   0.0014 **
setS         -2.4750     0.3539  -6.994 1.01e-09 ***
densityL     -0.0250     0.3539  -0.071   0.9439
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.583 on 74 degrees of freedom
Multiple R-squared:  0.4492,     Adjusted R-squared:  0.412
F-statistic: 12.07 on 5 and 74 DF,  p-value: 1.467e-08
```

```
Call:
lm(formula = leersia.oryzoides ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.5875 -1.5812 -0.3313  1.0062  7.8000

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.9375     0.8093   2.394  0.01919 *
block         0.0125     0.1857   0.067  0.94650
stratifiedS   1.6000     0.5251   3.047  0.00320 **
waterL       -1.0000     0.5251  -1.904  0.06076 .
setS         -1.6500     0.5251  -3.142  0.00241 **
densityL      0.6000     0.5251   1.143  0.25690
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.348 on 74 degrees of freedom
Multiple R-squared:  0.2456,     Adjusted R-squared:  0.1946
F-statistic: 4.818 on 5 and 74 DF,  p-value: 0.0007214


Call:
lm(formula = juncus.dudleyi ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.9250 -0.8891 -0.3000  0.6219  4.8125

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  3.84375    0.64847   5.927 9.07e-08 ***
block        0.09375    0.14877   0.630    0.531
stratifiedS -0.50000    0.42078  -1.188    0.239
waterL      -2.90000    0.42078  -6.892 1.56e-09 ***
setS         0.15000    0.42078   0.356    0.722
densityL    -0.35000    0.42078  -0.832    0.408
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.882 on 74 degrees of freedom
Multiple R-squared:  0.4038,     Adjusted R-squared:  0.3636
F-statistic: 10.03 on 5 and 74 DF,  p-value: 2.361e-07


Call:
lm(formula = scirpus.tabernaemontani ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.9875 -1.4062 -0.2312  0.5750  8.9375

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.2875     0.7544   1.707  0.09209 .
block         0.1875     0.1731   1.083  0.28218
stratifiedS   1.4000     0.4895   2.860  0.00550 **
waterL       -1.4500     0.4895  -2.962  0.00411 **
setS         -1.6000     0.4895  -3.268  0.00164 **
densityL     -0.4500     0.4895  -0.919  0.36096
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.189 on 74 degrees of freedom
Multiple R-squared:  0.2861,     Adjusted R-squared:  0.2378
F-statistic: 5.931 on 5 and 74 DF,  p-value: 0.0001154
```

```
Call:
lm(formula = asclepias.incarnata ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.6062 -1.0687 -0.3063  1.0906  5.1625

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.63125    0.58969   4.462 2.85e-05 ***
block       -0.06875    0.13528  -0.508  0.61283
stratifiedS  0.55000    0.38264   1.437  0.15483
waterL      -1.25000    0.38264  -3.267  0.00165 **
setS         0.70000    0.38264   1.829  0.07137 .
densityL    -0.10000    0.38264  -0.261  0.79456
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.711 on 74 degrees of freedom
Multiple R-squared:  0.1815,     Adjusted R-squared:  0.1262
F-statistic: 3.282 on 5 and 74 DF,  p-value: 0.009881


Call:
lm(formula = aster.puniceus ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-5.1938 -2.1516 -0.0687  2.0875  6.1312

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.9938     0.9604   4.158 8.53e-05 ***
block         0.2313     0.2203   1.050   0.2973
stratifiedS   0.2250     0.6232   0.361   0.7191
waterL       -1.2750     0.6232  -2.046   0.0443 *
setS          3.2750     0.6232   5.255 1.38e-06 ***
densityL     -0.8250     0.6232  -1.324   0.1896
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.787 on 74 degrees of freedom
Multiple R-squared:  0.3198,     Adjusted R-squared:  0.2738
F-statistic: 6.958 on 5 and 74 DF,  p-value: 2.247e-05


Call:
lm(formula = eupatorium.perfoliatum ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.4062 -1.3266 -0.4062  1.1328  5.7437

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.6813     0.6970   2.412  0.01834 *
block         0.1438     0.1599   0.899  0.37157
stratifiedS   1.5250     0.4523   3.372  0.00119 **
waterL       -1.1750     0.4523  -2.598  0.01131 *
setS          1.2750     0.4523   2.819  0.00617 **
densityL     -0.3750     0.4523  -0.829  0.40969
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.023 on 74 degrees of freedom
Multiple R-squared:  0.2714,     Adjusted R-squared:  0.2222
F-statistic: 5.512 on 5 and 74 DF,  p-value: 0.0002282
```

```
Call:
lm(formula = helenium.autumnale ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-5.6187 -1.2125 -0.2469  0.7891  8.1875

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   6.0938     0.8419   7.238 3.53e-10 ***
block        -0.1312     0.1932  -0.680   0.4989
stratifiedS   1.0000     0.5463   1.830   0.0712 .
waterL        0.8500     0.5463   1.556   0.1240
setS         -5.6000     0.5463 -10.250 7.55e-16 ***
densityL     -0.9500     0.5463  -1.739   0.0862 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.443 on 74 degrees of freedom
Multiple R-squared:  0.6071,     Adjusted R-squared:  0.5805
F-statistic: 22.86 on 5 and 74 DF,  p-value: 8.439e-14


Call:
lm(formula = lobelia.siphilitica ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-4.638 -1.762 -0.550  1.387  6.438

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.2375     0.8778   1.410   0.1628
block         0.8375     0.2014   4.159 8.52e-05 ***
stratifiedS   0.5500     0.5696   0.966   0.3374
waterL       -0.6500     0.5696  -1.141   0.2575
setS          1.0500     0.5696   1.843   0.0693 .
densityL     -0.9500     0.5696  -1.668   0.0996 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.547 on 74 degrees of freedom
Multiple R-squared:  0.2578,     Adjusted R-squared:  0.2077
F-statistic: 5.142 on 5 and 74 DF,  p-value: 0.0004207


Call:
lm(formula = scutellaria.lateriflora ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-0.3875 -0.1875 -0.0781  0.0266  4.5625

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.24375    0.20947   1.164    0.248
block       -0.05625    0.04806  -1.170    0.246
stratifiedS  0.20000    0.13592   1.471    0.145
waterL       0.05000    0.13592   0.368    0.714
setS        -0.05000    0.13592  -0.368    0.714
densityL    -0.15000    0.13592  -1.104    0.273

Residual standard error: 0.6079 on 74 degrees of freedom
Multiple R-squared:  0.06357,    Adjusted R-squared:  0.0002979
F-statistic: 1.005 on 5 and 74 DF,  p-value: 0.4211
```

```
Call:
lm(formula = solidago.gigantea ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-9.6750 -2.0781 -0.3875  2.1187 11.1250 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)  11.9875     1.2631   9.490 1.98e-14 ***
block        -0.4625     0.2898  -1.596   0.1147    
stratifiedS  -2.0000     0.8196  -2.440   0.0171 *  
waterL        1.1500     0.8196   1.403   0.1648    
setS         -8.7000     0.8196 -10.614  < 2e-16 ***
densityL     -0.8000     0.8196  -0.976   0.3322    
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 

Residual standard error: 3.666 on 74 degrees of freedom
Multiple R-squared:  0.6264,     Adjusted R-squared:  0.6012 
F-statistic: 24.82 on 5 and 74 DF,  p-value: 1.36e-14



Call:
lm(formula = cicuta.maculata ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.5063 -1.5156 -0.1719  1.2578  5.5250 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   2.7812     0.6893   4.035 0.000132 ***
block         0.2313     0.1581   1.462 0.147887    
stratifiedS   3.3500     0.4473   7.490 1.19e-10 ***
waterL       -2.8000     0.4473  -6.260 2.28e-08 ***
setS          0.0500     0.4473   0.112 0.911296    
densityL     -1.5500     0.4473  -3.465 0.000885 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 

Residual standard error: 2 on 74 degrees of freedom
Multiple R-squared:  0.5966,     Adjusted R-squared:  0.5693 
F-statistic: 21.89 on 5 and 74 DF,  p-value: 2.175e-13


Call:
lm(formula = stachys.palustris ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-1.0375 -0.5625 -0.2750  0.0375  6.9375 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)  
(Intercept)  1.03750    0.40584   2.556   0.0126 *
block       -0.15000    0.09311  -1.611   0.1114  
stratifiedS -0.27500    0.26334  -1.044   0.2998  
waterL      -0.32500    0.26334  -1.234   0.2211  
setS         0.17500    0.26334   0.665   0.5084  
densityL    -0.02500    0.26334  -0.095   0.9246  
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1 

Residual standard error: 1.178 on 74 degrees of freedom
Multiple R-squared:  0.07105,    Adjusted R-squared:  0.008282 
F-statistic: 1.132 on 5 and 74 DF,  p-value: 0.3511
```

```
Call:
lm(formula = carex.cristatella ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-1.637 -0.850 -0.350  0.575  3.812

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   0.9125     0.4393   2.077   0.0412 *
block         0.1250     0.1008   1.240   0.2187
stratifiedS   0.2250     0.2850   0.789   0.4324
waterL       -0.3750     0.2850  -1.316   0.1924
setS          0.0250     0.2850   0.088   0.9303
densityL     -0.3250     0.2850  -1.140   0.2579
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.275 on 74 degrees of freedom
Multiple R-squared:  0.06566,     Adjusted R-squared:  0.002532
F-statistic:  1.04 on 5 and 74 DF,  p-value: 0.4006
Call:
lm(formula = carex.hystericina ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-4.513 -1.256 -0.275  1.044  7.612

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.2875     0.7150   4.598 1.72e-05 ***
block         0.0500     0.1640   0.305   0.7613
stratifiedS   0.3750     0.4639   0.808   0.4215
waterL       -2.5250     0.4639  -5.443 6.52e-07 ***
setS          1.0750     0.4639   2.317   0.0233 *
densityL     -0.5750     0.4639  -1.239   0.2191
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.075 on 74 degrees of freedom
Multiple R-squared:  0.335,      Adjusted R-squared:   0.29
F-statistic: 7.455 on 5 and 74 DF,  p-value: 1.038e-05


Call:
lm(formula = carex.molesta ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.4875 -1.2719 -0.2062  1.3031  5.1000

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   3.4375     0.7139   4.815 7.61e-06 ***
block         0.0125     0.1638   0.076   0.9394
stratifiedS   0.2500     0.4633   0.540   0.5911
waterL       -0.5500     0.4633  -1.187   0.2389
setS          0.7000     0.4633   1.511   0.1350
densityL     -0.9500     0.4633  -2.051   0.0438 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.072 on 74 degrees of freedom
Multiple R-squared:  0.0997,     Adjusted R-squared:  0.03887
F-statistic: 1.639 on 5 and 74 DF,  p-value: 0.1603
```

```
Call:
lm(formula = carex.stipata ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.0625 -1.0141 -0.1531  0.9172  3.5625

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.1313     0.5520   2.049  0.04398 *
block         0.2063     0.1266   1.629  0.10765
stratifiedS   0.9000     0.3582   2.513  0.01416 *
waterL       -0.8500     0.3582  -2.373  0.02024 *
setS          1.1000     0.3582   3.071  0.00298 **
densityL     -0.4000     0.3582  -1.117  0.26774
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.602 on 74 degrees of freedom
Multiple R-squared:  0.2546,     Adjusted R-squared:  0.2042
F-statistic: 5.055 on 5 and 74 DF,  p-value: 0.0004862


Call:
lm(formula = carex.tribuloides ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-5.7375 -3.0781 -0.7156  2.6547  9.7437

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   6.4688     1.2595   5.136  2.2e-06 ***
block         0.1688     0.2889   0.584 0.560979
stratifiedS   1.4500     0.8173   1.774 0.080137 .
waterL       -2.9000     0.8173  -3.548 0.000677 ***
setS          2.5500     0.8173   3.120 0.002576 **
densityL     -1.9000     0.8173  -2.325 0.022825 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 3.655 on 74 degrees of freedom
Multiple R-squared:  0.2967,     Adjusted R-squared:  0.2492
F-statistic: 6.244 on 5 and 74 DF,  p-value: 6.958e-05


Call:
lm(formula = carex.vulpinoidea ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.9062 -0.9281 -0.1906  0.6469  6.5563

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  4.18125    0.61396   6.810 2.21e-09 ***
block        0.03125    0.14085   0.222   0.8250
stratifiedS  0.20000    0.39839   0.502   0.6171
waterL      -0.95000    0.39839  -2.385   0.0197 *
setS        -3.35000    0.39839  -8.409 2.18e-12 ***
densityL    -0.60000    0.39839  -1.506   0.1363
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.782 on 74 degrees of freedom
Multiple R-squared:  0.5162,     Adjusted R-squared:  0.4835
F-statistic: 15.79 on 5 and 74 DF,  p-value: 1.469e-10
```

Biomass

```
Call:
lm(formula = grasses ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-97.75 -50.63 -18.28  24.62 238.54

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  127.476     26.814   4.754 9.58e-06 ***
block         -1.927      6.152  -0.313 0.754939
setS          -3.155     17.399  -0.181 0.856601
waterL       -67.645     17.399  -3.888 0.000219 ***
stratifiedS   -4.382     17.399  -0.252 0.801873
densityL      17.971     17.399   1.033 0.305041
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 77.81 on 74 degrees of freedom
Multiple R-squared:  0.1812,     Adjusted R-squared:  0.1259
F-statistic: 3.275 on 5 and 74 DF,  p-value: 0.009998


Call:
lm(formula = sedges ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-259.99 -119.96   -9.92   47.09  830.40

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  253.683     57.805   4.389 3.73e-05 ***
block         -2.656     13.261  -0.200   0.8418
setS          78.132     37.509   2.083   0.0407 *
waterL       -67.137     37.509  -1.790   0.0776 .
stratifiedS   47.457     37.509   1.265   0.2098
densityL     -16.260     37.509  -0.433   0.6659
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 167.7 on 74 degrees of freedom
Multiple R-squared:  0.1124,     Adjusted R-squared:  0.05244
F-statistic: 1.874 on 5 and 74 DF,  p-value: 0.1091
```

```
Call:
lm(formula = forbs ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-187.55  -46.41   -6.16   31.92  265.49 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)  159.972     25.214   6.345 1.59e-08 ***
block         -1.934      5.784  -0.334   0.7390    
setS         -29.838     16.361  -1.824   0.0722 .  
waterL        23.555     16.361   1.440   0.1542    
stratifiedS   33.966     16.361   2.076   0.0414 *  
densityL     -13.266     16.361  -0.811   0.4200    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 73.17 on 74 degrees of freedom
Multiple R-squared:  0.124,	Adjusted R-squared:  0.06485 
F-statistic: 2.096 on 5 and 74 DF,  p-value: 0.07539


Call:
lm(formula = total ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-366.29 -145.52   -3.27  110.63  815.54 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)  541.131     70.946   7.627 6.54e-11 ***
block         -6.518     16.276  -0.400   0.6900    
setS          45.139     46.036   0.981   0.3300    
waterL      -111.228     46.036  -2.416   0.0182 *  
stratifiedS   77.042     46.036   1.674   0.0984 .  
densityL     -11.556     46.036  -0.251   0.8025    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 205.9 on 74 degrees of freedom
Multiple R-squared:  0.1172,	Adjusted R-squared:  0.05754 
F-statistic: 1.965 on 5 and 74 DF,  p-value: 0.09388


Call:
lm(formula = simpson ~ block + set + water + stratified + density,
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.3063 -1.2881 -0.0109  1.3721  4.3822 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   6.4357     0.6378  10.090  1.5e-15 ***
block         0.2521     0.1463   1.723 0.089083 .  
setS         -1.4548     0.4139  -3.515 0.000754 ***
waterL       -1.1146     0.4139  -2.693 0.008757 ** 
stratifiedS   0.6517     0.4139   1.575 0.119613    
densityL     -0.6409     0.4139  -1.548 0.125775    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 1.851 on 74 degrees of freedom
Multiple R-squared:  0.2706,	Adjusted R-squared:  0.2213 
F-statistic: 5.491 on 5 and 74 DF,  p-value: 0.0002366
```

```
Call:
lm(formula = calamagrostis.canadensis ~ block + stratified +
    water + set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-96.853 -28.701  -5.008  17.883 250.641

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   60.639     18.278   3.318  0.00141 **
block         -7.420      4.193  -1.770  0.08092 .
stratifiedS  -35.849     11.860  -3.023  0.00344 **
waterL        -1.660     11.860  -0.140  0.88908
setS          48.858     11.860   4.120 9.79e-05 ***
densityL      11.276     11.860   0.951  0.34484
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 53.04 on 74 degrees of freedom
Multiple R-squared:  0.2896,     Adjusted R-squared:  0.2416
F-statistic: 6.032 on 5 and 74 DF,  p-value: 9.786e-05


Call:
lm(formula = glyceria.striata ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-27.137  -9.053  -3.011   4.548 116.390

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   18.419      6.816   2.702 0.008536 **
block          1.018      1.564   0.651 0.516842
stratifiedS    0.792      4.423   0.179 0.858372
waterL       -13.516      4.423  -3.056 0.003119 **
setS         -17.320      4.423  -3.916 0.000199 ***
densityL       5.889      4.423   1.331 0.187127
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 19.78 on 74 degrees of freedom
Multiple R-squared:  0.2666,     Adjusted R-squared:  0.2171
F-statistic: 5.381 on 5 and 74 DF,  p-value: 0.0002834


Call:
lm(formula = leersia.oryzoides ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-16.676  -7.527  -2.649   3.026  49.719

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   5.4369     4.4821   1.213  0.22898
block         0.4573     1.0283   0.445  0.65781
stratifiedS   9.4097     2.9084   3.235  0.00182 **
waterL       -6.6709     2.9084  -2.294  0.02465 *
setS         -9.9642     2.9084  -3.426  0.00100 **
densityL      4.1523     2.9084   1.428  0.15759
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 13.01 on 74 degrees of freedom
Multiple R-squared:  0.2864,     Adjusted R-squared:  0.2382
F-statistic:  5.94 on 5 and 74 DF,  p-value: 0.0001135
```

```
Call:
lm(formula = juncus.dudleyi ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-26.675  -7.983  -3.086   5.613  49.657

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  22.2660     5.4742   4.067 0.000118 ***
block         0.5387     1.2559   0.429 0.669197
stratifiedS  -1.1610     3.5522  -0.327 0.744709
waterL      -18.6664     3.5522  -5.255 1.38e-06 ***
setS          3.4153     3.5522   0.961 0.339447
densityL     -2.0883     3.5522  -0.588 0.558392
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 15.89 on 74 degrees of freedom
Multiple R-squared:  0.2828,     Adjusted R-squared:  0.2343
F-statistic: 5.835 on 5 and 74 DF,  p-value: 0.0001347


Call:
lm(formula = scirpus.tabernaemontani ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-55.549 -24.211  -5.814   5.534 186.967

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   20.467     14.185   1.443  0.15328
block          3.478      3.254   1.069  0.28864
stratifiedS   22.261      9.205   2.418  0.01805 *
waterL       -26.967      9.205  -2.930  0.00451 **
setS         -27.979      9.205  -3.040  0.00327 **
densityL      -1.093      9.205  -0.119  0.90581
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 41.16 on 74 degrees of freedom
Multiple R-squared:  0.2512,     Adjusted R-squared:  0.2006
F-statistic: 4.966 on 5 and 74 DF,  p-value: 0.0005641


Call:
lm(formula = asclepias.incarnata ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-8.685 -3.568 -1.808  1.327 34.629

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   4.9995     2.2677   2.205   0.0306 *
block         0.2287     0.5202   0.440   0.6615
stratifiedS   0.6054     1.4715   0.411   0.6820
waterL       -1.9392     1.4715  -1.318   0.1916
setS          2.1654     1.4715   1.472   0.1454
densityL     -0.6592     1.4715  -0.448   0.6554
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 6.581 on 74 degrees of freedom
Multiple R-squared:  0.05691,    Adjusted R-squared:  -0.00681
F-statistic: 0.8931 on 5 and 74 DF,  p-value: 0.4903
```

```
Call:
lm(formula = aster.puniceus ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-38.127 -18.255  -4.377  11.526 100.751 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   6.0966     9.6064   0.635   0.5276    
block         3.2743     2.2039   1.486   0.1416    
stratifiedS   0.1754     6.2334   0.028   0.9776    
waterL       12.0071     6.2334   1.926   0.0579 .  
setS         30.2034     6.2334   4.845 6.77e-06 ***
densityL      1.4343     6.2334   0.230   0.8186    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 27.88 on 74 degrees of freedom
Multiple R-squared:  0.2847,     Adjusted R-squared:  0.2363 
F-statistic:  5.89 on 5 and 74 DF,  p-value: 0.0001232


Call:
lm(formula = eupatorium.perfoliatum ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-58.646 -25.854  -6.673  17.774  97.336 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)   
(Intercept)   3.7438    11.8320   0.316  0.75258   
block         3.7558     2.7144   1.384  0.17063   
stratifiedS  25.8512     7.6776   3.367  0.00121 **
waterL       -3.4203     7.6776  -0.445  0.65727   
setS         20.5475     7.6776   2.676  0.00916 **
densityL     -0.3527     7.6776  -0.046  0.96349   
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 34.34 on 74 degrees of freedom
Multiple R-squared:  0.2179,     Adjusted R-squared:  0.165 
F-statistic: 4.123 on 5 and 74 DF,  p-value: 0.002337


Call:
lm(formula = helenium.autumnale ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max 
-79.63 -27.66  -2.52  13.69 329.96 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)    
(Intercept)   73.199     17.674   4.142 9.05e-05 ***
block         -5.736      4.055  -1.415    0.161    
stratifiedS   -4.689     11.469  -0.409    0.684    
waterL        16.851     11.469   1.469    0.146    
setS         -58.079     11.469  -5.064 2.91e-06 ***
densityL      -2.286     11.469  -0.199    0.843    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 51.29 on 74 degrees of freedom
Multiple R-squared:  0.2886,     Adjusted R-squared:  0.2405 
F-statistic: 6.003 on 5 and 74 DF,  p-value: 0.0001027
```

```
Call:
lm(formula = lobelia.siphilitica ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-22.208  -8.783  -3.770   3.893  75.542

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    3.880      5.130   0.756   0.4518
block          1.067      1.177   0.906   0.3677
stratifiedS   -1.186      3.328  -0.356   0.7226
waterL         6.458      3.328   1.940   0.0562 .
setS           7.604      3.328   2.284   0.0252 *
densityL      -3.619      3.328  -1.087   0.2805
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 14.89 on 74 degrees of freedom
Multiple R-squared:  0.1306,     Adjusted R-squared:  0.07182
F-statistic: 2.223 on 5 and 74 DF,  p-value: 0.06085


Call:
lm(formula = scutellaria.lateriflora ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-1.3246 -0.5621 -0.2368  0.1280  9.2771

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.0454     0.4469   2.339   0.0220 *
block        -0.1922     0.1025  -1.875   0.0647 .
stratifiedS   0.4714     0.2900   1.626   0.1083
waterL       -0.2376     0.2900  -0.820   0.4151
setS         -0.1547     0.2900  -0.534   0.5952
densityL     -0.1582     0.2900  -0.546   0.5869
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.297 on 74 degrees of freedom
Multiple R-squared:  0.09106,    Adjusted R-squared:  0.02964
F-statistic: 1.483 on 5 and 74 DF,  p-value: 0.2058


Call:
lm(formula = solidago.gigantea ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-40.637 -10.976  -3.196   3.782 134.949

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   49.202      8.720   5.642 2.91e-07 ***
block         -2.166      2.001  -1.083    0.282
stratifiedS   -5.094      5.659  -0.900    0.371
waterL         6.025      5.659   1.065    0.290
setS         -37.898      5.659  -6.697 3.58e-09 ***
densityL      -1.305      5.659  -0.231    0.818
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 25.31 on 74 degrees of freedom
Multiple R-squared:  0.3936,     Adjusted R-squared:  0.3526
F-statistic: 9.605 on 5 and 74 DF,  p-value: 4.285e-07
```

```
Call:
lm(formula = cicuta.maculata ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-31.958  -8.118  -2.343   3.661  52.035

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   16.887      5.094   3.315 0.001422 **
block         -2.048      1.169  -1.752 0.083890 .
stratifiedS   17.845      3.306   5.398 7.78e-07 ***
waterL       -11.807      3.306  -3.572 0.000628 ***
setS           5.489      3.306   1.660 0.101049
densityL      -6.215      3.306  -1.880 0.064029 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 14.78 on 74 degrees of freedom
Multiple R-squared:  0.4092,     Adjusted R-squared:  0.3693
F-statistic: 10.25 on 5 and 74 DF,  p-value: 1.718e-07


Call:
lm(formula = stachys.palustris ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-1.0711 -0.5871 -0.3056  0.0540  5.7496

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.91764    0.36533   2.512   0.0142 *
block       -0.11776    0.08381  -1.405   0.1642
stratifiedS -0.01330    0.23705  -0.056   0.9554
waterL      -0.38260    0.23705  -1.614   0.1108
setS         0.28450    0.23705   1.200   0.2339
densityL    -0.10550    0.23705  -0.445   0.6576
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.06 on 74 degrees of freedom
Multiple R-squared:  0.07755,    Adjusted R-squared:  0.01522
F-statistic: 1.244 on 5 and 74 DF,  p-value: 0.2973


Call:
lm(formula = carex.cristatella ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-19.034 -10.764  -3.560   3.842  72.269

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  11.1191     5.6619   1.964   0.0533 .
block        -0.2133     1.2989  -0.164   0.8700
stratifiedS  -2.6560     3.6739  -0.723   0.4720
waterL        1.4991     3.6739   0.408   0.6844
setS          9.2848     3.6739   2.527   0.0136 *
densityL     -7.6528     3.6739  -2.083   0.0407 *
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 16.43 on 74 degrees of freedom
Multiple R-squared:  0.1339,     Adjusted R-squared:  0.0754
F-statistic: 2.288 on 5 and 74 DF,  p-value: 0.05442
```

```
Call:
lm(formula = carex.hystericina ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-87.93 -33.96 -16.64  12.24 272.64

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   66.360     23.205   2.860  0.00551 **
block         -1.329      5.323  -0.250  0.80361
stratifiedS   31.240     15.057   2.075  0.04149 *
waterL       -46.820     15.057  -3.109  0.00266 **
setS          13.228     15.057   0.879  0.38250
densityL     -12.375     15.057  -0.822  0.41380
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 67.34 on 74 degrees of freedom
Multiple R-squared:  0.173,      Adjusted R-squared:  0.1171
F-statistic: 3.097 on 5 and 74 DF,  p-value: 0.0136
```

```
Call:
lm(formula = carex.molesta ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-52.898 -16.073  -1.363   8.931 108.879

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    9.855      9.391   1.049   0.2974
block         -1.071      2.154  -0.497   0.6206
stratifiedS   -4.633      6.093  -0.760   0.4495
waterL        15.184      6.093   2.492   0.0149 *
setS          26.229      6.093   4.304 5.06e-05 ***
densityL       2.701      6.093   0.443   0.6589
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 27.25 on 74 degrees of freedom
Multiple R-squared:  0.2582,     Adjusted R-squared:  0.2081
F-statistic: 5.152 on 5 and 74 DF,  p-value: 0.0004138
```


```
Call:
lm(formula = carex.hystericina ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-87.93 -33.96 -16.64  12.24 272.64

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   66.360     23.205   2.860  0.00551 **
block         -1.329      5.323  -0.250  0.80361
stratifiedS   31.240     15.057   2.075  0.04149 *
waterL       -46.820     15.057  -3.109  0.00266 **
setS          13.228     15.057   0.879  0.38250
densityL     -12.375     15.057  -0.822  0.41380
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 67.34 on 74 degrees of freedom
Multiple R-squared:  0.173,      Adjusted R-squared:  0.1171
F-statistic: 3.097 on 5 and 74 DF,  p-value: 0.0136
```

```
Call:
lm(formula = carex.molesta ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-52.898 -16.073  -1.363   8.931 108.879

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)    9.855      9.391   1.049   0.2974
block         -1.071      2.154  -0.497   0.6206
stratifiedS   -4.633      6.093  -0.760   0.4495
waterL        15.184      6.093   2.492   0.0149 *
setS          26.229      6.093   4.304 5.06e-05 ***
densityL       2.701      6.093   0.443   0.6589
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 27.25 on 74 degrees of freedom
Multiple R-squared:  0.2582,     Adjusted R-squared:  0.2081
F-statistic: 5.152 on 5 and 74 DF,  p-value: 0.0004138


Call:
lm(formula = carex.stipata ~ block + stratified + water + set +
    density, data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
-68.34 -38.48 -14.85  18.49 759.26

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   0.7667    33.4535   0.023    0.982
block         6.7214     7.6748   0.876    0.384
stratifiedS  24.1973    21.7075   1.115    0.269
waterL        0.8713    21.7075   0.040    0.968
setS          0.3790    21.7075   0.017    0.986
densityL     16.4928    21.7075   0.760    0.450

Residual standard error: 97.08 on 74 degrees of freedom
Multiple R-squared:  0.0338,     Adjusted R-squared:  -0.03148
F-statistic: 0.5177 on 5 and 74 DF,  p-value: 0.7621


Call:
lm(formula = carex.tribuloides ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-129.54  -56.67  -17.36   55.58  344.99

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  122.969     28.762   4.275 5.62e-05 ***
block         -5.072      6.598  -0.769 0.444494
stratifiedS    1.816     18.663   0.097 0.922750
waterL       -33.815     18.663  -1.812 0.074065 .
setS          64.938     18.663   3.479 0.000846 ***
densityL     -21.512     18.663  -1.153 0.252759
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 83.46 on 74 degrees of freedom
Multiple R-squared:  0.1897,     Adjusted R-squared:  0.1349
F-statistic: 3.464 on 5 and 74 DF,  p-value: 0.007228
```

```
Call:
lm(formula = carex.vulpinoidea ~ block + stratified + water +
    set + density, data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-40.962  -8.440  -1.409   5.408 138.842

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   42.022      8.666   4.849 6.68e-06 ***
block         -1.544      1.988  -0.777    0.440
stratifiedS   -2.211      5.623  -0.393    0.695
waterL        -3.761      5.623  -0.669    0.506
setS         -36.222      5.623  -6.442 1.06e-08 ***
densityL       5.791      5.623   1.030    0.306
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 25.15 on 74 degrees of freedom
Multiple R-squared:  0.3716,     Adjusted R-squared:  0.3291
F-statistic: 8.752 on 5 and 74 DF,  p-value: 1.475e-06
```

Study Two

```
Call:
lm(formula = grasses ~ block + water + as.factor(date), data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-8.3349 -2.1203 -0.3826  2.8169  5.3609 

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)    
(Intercept)      13.50849    1.28345  10.525 8.64e-15 ***
block            -0.43471    0.30978  -1.403  0.16615    
water            -0.19155    0.05843  -3.278  0.00181 ** 
as.factor(date)2  0.67826    1.05854   0.641  0.52434    
as.factor(date)3  0.42174    1.05854   0.398  0.69187    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 3.347 on 55 degrees of freedom
Multiple R-squared:  0.1941,	Adjusted R-squared:  0.1355 
F-statistic: 3.312 on 4 and 55 DF,  p-value: 0.01676 


Call:
lm(formula = sedges ~ block + water + as.factor(date), data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-6.3764 -1.9206  0.0175  1.9852  6.0603 

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)    
(Intercept)       9.31481    1.04513   8.913 2.92e-12 ***
block            -0.47891    0.25226  -1.898  0.06288 .  
water             0.15406    0.04758   3.238  0.00204 ** 
as.factor(date)2  0.12605    0.86198   0.146  0.88427    
as.factor(date)3 -1.97605    0.86198  -2.292  0.02573 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 2.726 on 55 degrees of freedom
Multiple R-squared:  0.2831,	Adjusted R-squared:  0.231 
F-statistic:  5.43 on 4 and 55 DF,  p-value: 0.00093
```

```
Call:
lm(formula = forbs ~ block + water + as.factor(date), data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-7.4027 -1.9992  0.2811  1.5458  8.3783 

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)    
(Intercept)       4.75044    1.19369   3.980 0.000204 ***
block            -0.09788    0.28811  -0.340 0.735360    
water             0.60438    0.05435  11.121 1.08e-15 ***
as.factor(date)2  2.04511    0.98451   2.077 0.042457 *  
as.factor(date)3 -2.79511    0.98451  -2.839 0.006328 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 3.113 on 55 degrees of freedom
Multiple R-squared:  0.7293,    Adjusted R-squared:  0.7096 
F-statistic: 37.05 on 4 and 55 DF,  p-value: 5.2e-15



Call:
lm(formula = total ~ block + water + as.factor(date), data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max 
-10.8816  -2.2618  -0.2924   2.9310  11.7654 

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)    
(Intercept)      27.57374    1.82348  15.122  < 2e-16 ***
block            -1.01150    0.44012  -2.298  0.02538 *  
water             0.56688    0.08302   6.828 7.21e-09 ***
as.factor(date)2  2.84942    1.50393   1.895  0.06340 .  
as.factor(date)3 -4.34942    1.50393  -2.892  0.00547 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 4.755 on 55 degrees of freedom
Multiple R-squared:  0.5785,    Adjusted R-squared:  0.5479 
F-statistic: 18.87 on 4 and 55 DF,  p-value: 8.12e-10


Call:
lm(formula = simpson ~ block + water + as.factor(date), data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max 
-2.50762 -0.67368  0.00326  0.67308  2.85091 

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)    
(Intercept)       4.75903    0.46000  10.346 1.63e-14 ***
block             0.11244    0.11103   1.013  0.31562    
water             0.19937    0.02094   9.519 3.16e-13 ***
as.factor(date)2  0.36735    0.37939   0.968  0.33716    
as.factor(date)3 -1.29151    0.37939  -3.404  0.00125 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.2 on 55 degrees of freedom
Multiple R-squared:  0.672,     Adjusted R-squared:  0.6482 
F-statistic: 28.17 on 4 and 55 DF,  p-value: 9.453e-13
```

```
Call:
lm(formula = calamagrostis.canadensis ~ block + water + as.factor(date),
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.22736 -0.10840 -0.06447 -0.01945  0.98719 

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)
(Intercept)       -0.0240241  0.1072240  -0.224    0.824
block              0.0184173  0.0258802   0.712    0.480
water              0.0079649  0.0048818   1.632    0.108
as.factor(date)2 -0.0490791  0.0884341  -0.555    0.581
as.factor(date)3 -0.0009209  0.0884341  -0.010    0.992

Residual standard error: 0.2796 on 55 degrees of freedom
Multiple R-squared:  0.06173,   Adjusted R-squared:  -0.006508 
F-statistic: 0.9046 on 4 and 55 DF,  p-value: 0.4677
```

```
Call:
lm(formula = glyceria.striata ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-1.0299 -0.5012 -0.2636  0.3712  2.5629 

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)       0.40818    0.28209   1.447    0.154
block            -0.06188    0.06809  -0.909    0.367
water             0.01993    0.01284   1.552    0.126
as.factor(date)2  0.34691    0.23266   1.491    0.142
as.factor(date)3  0.05309    0.23266   0.228    0.820

Residual standard error: 0.7357 on 55 degrees of freedom
Multiple R-squared:  0.09619,   Adjusted R-squared:  0.03046 
F-statistic: 1.463 on 4 and 55 DF,  p-value: 0.2258
```

```
Call:
lm(formula = juncus.dudleyi ~ block + water + as.factor(date),
    data = sedge)

Residuals:
   Min     1Q Median     3Q    Max 
-4.633 -1.455 -0.214  1.403  6.609 

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)    
(Intercept)       4.17074    0.85822   4.860 1.02e-05 ***
block            -0.06162    0.20715  -0.297    0.767    
water            -0.07303    0.03907  -1.869    0.067 .  
as.factor(date)2  0.64692    0.70783   0.914    0.365    
as.factor(date)3 -0.29692    0.70783  -0.419    0.676    
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2.238 on 55 degrees of freedom
Multiple R-squared:  0.09055,   Adjusted R-squared:  0.02441 
F-statistic: 1.369 on 4 and 55 DF,  p-value: 0.2566
```

```
Call:
lm(formula = scirpus.tabernaemontani ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-7.3054 -1.3666  0.1019  1.4431  5.1588

Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
(Intercept)        8.95360    0.95069   9.418 4.57e-13 ***
block             -0.32963    0.22946  -1.437  0.15651
water             -0.14642    0.04328  -3.383  0.00133 **
as.factor(date)2 -0.26648    0.78409  -0.340  0.73526
as.factor(date)3  0.66648    0.78409   0.850  0.39901
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.479 on 55 degrees of freedom
Multiple R-squared:  0.2144,    Adjusted R-squared:  0.1573
F-statistic: 3.753 on 4 and 55 DF,  p-value: 0.009047


Call:
lm(formula = asclepias.incarnata ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.4283 -1.0364 -0.3576  0.6128  4.6164

Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
(Intercept)        1.18206    0.57251   2.065  0.04368 *
block             -0.29843    0.13818  -2.160  0.03518 *
water              0.06266    0.02607   2.404  0.01961 *
as.factor(date)2  1.48508    0.47219   3.145  0.00268 **
as.factor(date)3  0.51492    0.47219   1.091  0.28024
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.493 on 55 degrees of freedom
Multiple R-squared:  0.2745,    Adjusted R-squared:  0.2217
F-statistic: 5.202 on 4 and 55 DF,  p-value: 0.001258


Call:
lm(formula = aster.puniceus ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-1.9344 -0.7297 -0.2552  0.5324  3.6654

Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
(Intercept)        0.66228    0.44754   1.480 0.144632
block             -0.16896    0.10802  -1.564 0.123528
water              0.08413    0.02038   4.129 0.000125 ***
as.factor(date)2  0.54155    0.36912   1.467 0.148029
as.factor(date)3 -0.24155    0.36912  -0.654 0.515578
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.167 on 55 degrees of freedom
Multiple R-squared:  0.3063,    Adjusted R-squared:  0.2558
F-statistic: 6.071 on 4 and 55 DF,  p-value: 0.0004041
```

```
Call:
lm(formula = eupatorium.perfoliatum ~ block + water + as.factor(date),
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-0.10671 -0.05867 -0.02682  0.00167  0.92692

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)       0.1306731  0.0698272   1.871   0.0666 .
block            -0.0252295  0.0168539  -1.497   0.1401
water            -0.0007138  0.0031791  -0.225   0.8232
as.factor(date)2 -0.0512615  0.0575907  -0.890   0.3773
as.factor(date)3  0.0012615  0.0575907   0.022   0.9826
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1821 on 55 degrees of freedom
Multiple R-squared:  0.05666,   Adjusted R-squared:  -0.01195
F-statistic: 0.8259 on 4 and 55 DF,  p-value: 0.5144


Call:
lm(formula = helenium.autumnale ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.2689 -0.8137 -0.1341  0.6024  4.2179

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)       2.28637    0.53861   4.245 8.48e-05 ***
block            -0.12831    0.13000  -0.987   0.3280
water             0.12482    0.02452   5.090 4.49e-06 ***
as.factor(date)2  0.39358    0.44422   0.886   0.3795
as.factor(date)3 -1.64358    0.44422  -3.700   0.0005 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.405 on 55 degrees of freedom
Multiple R-squared:  0.4798,    Adjusted R-squared:  0.4419
F-statistic: 12.68 on 4 and 55 DF,  p-value: 2.225e-07


Call:
lm(formula = lobelia.siphilitica ~ block + water + as.factor(date),
    data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
     0      0      0      0      0

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)             0          0      NA       NA
block                   0          0      NA       NA
water                   0          0      NA       NA
as.factor(date)2        0          0      NA       NA
as.factor(date)3        0          0      NA       NA

Residual standard error: 0 on 55 degrees of freedom
Multiple R-squared:    NaN,     Adjusted R-squared:    NaN
F-statistic:   NaN on 4 and 55 DF,  p-value: NA
```

```
Call:
lm(formula = scutellaria.lateriflora ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-1.4164 -0.4248 -0.1438  0.1879  2.2972

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)      -0.36822    0.28487  -1.293    0.202
block             0.15621    0.06876   2.272    0.027 *
water             0.05799    0.01297   4.471 3.94e-05 ***
as.factor(date)2 -0.09219    0.23495  -0.392    0.696
as.factor(date)3 -0.25781    0.23495  -1.097    0.277
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.7429 on 55 degrees of freedom
Multiple R-squared:  0.3252,    Adjusted R-squared:  0.2761
F-statistic: 6.627 on 4 and 55 DF,  p-value: 0.0001994


Call:
lm(formula = solidago.gigantea ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.7938 -0.8501 -0.1987  0.7621  4.4936

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)      -0.59957    0.61930  -0.968   0.3372
block             0.28735    0.14948   1.922   0.0597 .
water             0.24021    0.02820   8.520 1.25e-11 ***
as.factor(date)2  0.01437    0.51077   0.028   0.9777
as.factor(date)3 -0.66437    0.51077  -1.301   0.1988
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.615 on 55 degrees of freedom
Multiple R-squared:  0.5889,    Adjusted R-squared:  0.559
F-statistic: 19.69 on 4 and 55 DF,  p-value: 4.168e-10


Call:
lm(formula = cicuta.maculata ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-2.1276 -0.9129 -0.2253  0.7559  3.8087

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)       1.45685    0.51158   2.848  0.00618 **
block             0.07948    0.12348   0.644  0.52245
water             0.03528    0.02329   1.515  0.13560
as.factor(date)2 -0.24603    0.42193  -0.583  0.56221
as.factor(date)3 -0.50397    0.42193  -1.194  0.23743
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.334 on 55 degrees of freedom
Multiple R-squared:  0.06989,   Adjusted R-squared:  0.002247
F-statistic: 1.033 on 4 and 55 DF,  p-value: 0.3984
```

```
Call:
lm(formula = stachys.palustris ~ block + water + as.factor(date),
    data = sedge)

Residuals:
   Min     1Q Median     3Q    Max
     0      0      0      0      0

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)             0          0      NA       NA
block                   0          0      NA       NA
water                   0          0      NA       NA
as.factor(date)2        0          0      NA       NA
as.factor(date)3        0          0      NA       NA

Residual standard error: 0 on 55 degrees of freedom
Multiple R-squared:    NaN,     Adjusted R-squared:    NaN
F-statistic:   NaN on 4 and 55 DF,  p-value: NA
Call:
lm(formula = carex.cristatella ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-3.7247 -1.2307 -0.1179  1.1638  4.6857

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)       4.94069    0.74344   6.646 1.43e-08 ***
block            -0.41046    0.17944  -2.287    0.026 *
water             0.01945    0.03385   0.575    0.568
as.factor(date)2  0.22948    0.61316   0.374    0.710
as.factor(date)3 -0.07948    0.61316  -0.130    0.897
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.939 on 55 degrees of freedom
Multiple R-squared:  0.09662,   Adjusted R-squared:  0.03092
F-statistic: 1.471 on 4 and 55 DF,  p-value: 0.2237


Call:
lm(formula = carex.hystericina ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max
-1.7654 -0.8307 -0.3019  0.7495  3.1620

Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
(Intercept)       1.460228   0.445249   3.280  0.00181 **
block             0.072649   0.107468   0.676  0.50187
water             0.002909   0.020272   0.144  0.88641
as.factor(date)2 -0.296368   0.367224  -0.807  0.42311
as.factor(date)3 -0.603632   0.367224  -1.644  0.10593
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.161 on 55 degrees of freedom
Multiple R-squared:  0.05417,   Adjusted R-squared:  -0.01462
F-statistic: 0.7874 on 4 and 55 DF,  p-value: 0.5383
```

```
Call:
lm(formula = carex.molesta ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-1.2360 -0.4301 -0.1625  0.4996  2.4318 

Coefficients:
                  Estimate Std. Error t value Pr(>|t|)  
(Intercept)      -0.058990   0.279197  -0.211   0.8334  
block             0.112156   0.067389   1.664   0.1017  
water             0.008929   0.012711   0.702   0.4854  
as.factor(date)2  0.555608   0.230271   2.413   0.0192 *
as.factor(date)3 -0.005608   0.230271  -0.024   0.9807  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 0.7281 on 55 degrees of freedom
Multiple R-squared:  0.1653,	Adjusted R-squared:  0.1046 
F-statistic: 2.724 on 4 and 55 DF,  p-value: 0.0385 


Call:
lm(formula = carex.stipata ~ block + water + as.factor(date),
    data = sedge)

Residuals:
    Min      1Q  Median      3Q     Max 
-1.0792 -0.5140 -0.2125  0.5059  1.6595 

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)   
(Intercept)       0.25104    0.27496   0.913  0.36524   
block             0.02237    0.06637   0.337  0.73730   
water             0.03805    0.01252   3.040  0.00362 **
as.factor(date)2 -0.04888    0.22678  -0.216  0.83014   
as.factor(date)3  0.09888    0.22678   0.436  0.66452   
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1 

Residual standard error: 0.7171 on 55 degrees of freedom
Multiple R-squared:  0.1516,	Adjusted R-squared:  0.08991 
F-statistic: 2.457 on 4 and 55 DF,  p-value: 0.05621 


Call:
lm(formula = carex.tribuloides ~ block + water + as.factor(date),
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.50645 -0.35788 -0.22506  0.07482  1.65001 

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)
(Intercept)       0.1758842  0.2160899   0.814    0.419
block             0.0445849  0.0521566   0.855    0.396
water            -0.0008468  0.0098383  -0.086    0.932
as.factor(date)2  0.1522292  0.1782224   0.854    0.397
as.factor(date)3 -0.1522292  0.1782224  -0.854    0.397

Residual standard error: 0.5635 on 55 degrees of freedom
Multiple R-squared:  0.06097,	Adjusted R-squared:  -0.007328 
F-statistic: 0.8927 on 4 and 55 DF,  p-value: 0.4746 
```

```
Call:
lm(formula = carex.vulpinoidea ~ block + water + as.factor(date),
    data = sedge)

Residuals:
     Min       1Q   Median       3Q      Max
-2.51034 -0.77064 -0.09036  0.66578  2.87927

Coefficients:
                 Estimate Std. Error t value Pr(>|t|)
(Intercept)       2.54596    0.45224   5.630 6.33e-07 ***
block            -0.32021    0.10915  -2.934 0.004878 **
water             0.08556    0.02059   4.156 0.000114 ***
as.factor(date)2 -0.46601    0.37299  -1.249 0.216811
as.factor(date)3 -1.23399    0.37299  -3.308 0.001659 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.179 on 55 degrees of freedom
Multiple R-squared:  0.4032,    Adjusted R-squared:  0.3598
F-statistic:  9.29 on 4 and 55 DF,  p-value: 8.272e-06
```

APPENDIX C: RAW DATA

This appendix provides the raw data for both studies. The first study (presented in Chapter II) is separated into two sections. The count data is shown first and the biomass data is shown second. The raw data from the second study (presented in Chapter III) follows the first study. However, the second study only contains count data. Below are descriptions/definitions of the headings.

Definitions

Unit – the number assigned to each mesocosm for data-tracking purposes.

Count – the number, in sequence, of the count. There was a count every two weeks during the growing season. There was a maximum of five counts in a given year.

Year – Corresponds to the year of the count. Year 1, 2, and 3 stand for 2014, 2015, and 2016 respectively.

Species set – Corresponds to the species-set treatment. C stands for complete set; S stands for split-set.

Groundwater level – Corresponds to the groundwater level treatment. H stands for high; L stands for low. In the second study, the value corresponds to the cm below the soil surface the water level was kept at for that mesocosm.

Stratification – Corresponds to the stratification treatment. S stands for stratified; N stands for not-stratified.

Seeding density – Corresponds to the seeding density treatment. H stands for high; L stands for low.

Seeding date – Corresponds to the seasonal planting treatment in the second study. Date 1 was June 16; date 2 was June 30; date 3 was July 14, 2016.

Study One

Count Data

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
1	1	1	1	C	H	S	H	2	6	7	0	0	0	2	2	1	3	11	0	4	9	5	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	35	31	17	83	19.7
2	1	1	1	C	H	N	H	4	5	5	0	0	3	0	11	2	1	11	0	5	7	2	5	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	44	21	17	82	15.8
3	1	1	1	S	L	S	L	2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3	4	2	9	6.2
4	1	1	1	S	L	N	L	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2	0	2	4	2.0
5	1	1	1	S	H	S	L	3	0	0	0	0	4	0	5	2	3	0	0	5	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	17	13	7	37	14.9
6	1	1	1	S	H	S	H	1	0	0	0	0	0	0	6	2	3	0	0	3	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	16	13	1	30	14.3
7	1	1	1	C	H	S	L	0	3	5	0	0	1	4	6	3	2	3	0	2	4	6	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26	21	13	60	21.8
8	1	1	1	C	L	S	L	0	1	2	0	0	0	0	7	1	0	9	0	0	8	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26	11	3	40	8.0
9	1	1	1	C	L	S	H	0	0	4	0	0	0	0	10	2	0	4	0	0	4	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	20	3	4	27	4.8
10	1	1	1	C	L	N	H	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	1	0	5	4.2
11	1	1	1	S	H	N	L	4	0	0	0	0	4	0	8	4	2	0	1	5	0	1	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	22	28	8	58	23.4
12	1	1	1	C	L	N	L	0	0	0	0	0	0	0	1	4	0	2	3	3	13	0	4	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	30	4	0	34	5.2
13	1	1	1	C	H	N	L	2	6	5	0	0	1	0	5	2	1	4	0	3	8	0	3	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26	21	14	61	19.2
14	1	1	1	S	H	N	H	4	0	0	0	0	2	0	8	1	2	0	0	4	0	3	2	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	20	24	6	50	21.2
15	1	1	1	S	L	S	H	0	0	0	0	0	1	0	18	9	3	0	0	3	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	34	4	1	39	3.6
16	1	1	1	S	L	N	H	3	0	0	0	0	1	0	2	12	1	0	0	2	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	17	7	4	28	4.8
17	1	1	2	S	L	S	H	4	0	0	0	0	0	0	11	13	3	0	2	5	0	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	37	23	4	64	11.6
18	1	1	2	C	H	N	L	0	5	1	0	0	2	0	5	2	1	9	0	1	16	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	35	27	8	70	12.3
19	1	1	2	S	H	S	H	2	0	0	0	0	4	0	12	4	4	0	0	1	0	9	2	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	32	35	6	73	18.9
20	1	1	2	C	L	N	H	2	0	1	0	0	0	0	4	2	0	7	0	0	11	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	24	13	3	40	8.2
21	1	1	2	S	H	N	H	6	0	0	0	0	7	0	9	11	4	0	0	2	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26	34	13	73	17.4
22	1	1	2	S	L	N	H	3	0	0	0	0	0	0	4	8	4	0	0	2	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	20	22	3	45	17.9
23	1	1	2	S	H	S	L	1	0	0	0	0	3	0	10	7	2	0	0	2	0	8	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	29	35	4	68	20.0
24	1	1	2	C	H	N	H	5	6	2	0	0	4	0	9	6	5	8	0	1	14	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	43	36	17	96	19.0
25	1	1	2	C	L	S	H	4	2	3	0	0	0	0	16	6	2	12	0	2	13	2	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	54	12	9	75	8.7
26	1	1	2	C	L	S	L	2	4	4	0	0	0	0	8	8	5	7	0	1	11	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	43	18	10	71	13.7
27	1	1	2	S	H	N	L	1	0	0	0	0	3	0	5	8	3	0	2	3	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23	30	4	57	26.0
28	1	1	2	C	H	S	L	2	6	8	0	0	2	3	8	8	4	5	0	3	9	8	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	46	25	21	92	19.2
29	1	1	2	C	H	S	H	5	8	12	0	0	4	4	4	6	3	15	0	6	10	9	2	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	55	52	33	140	25.4
30	1	1	2	S	L	S	L	2	0	0	0	0	3	0	5	6	6	0	0	1	0	2	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21	24	5	50	21.6
31	1	1	2	C	L	N	L	2	2	1	0	0	0	0	1	3	0	9	0	0	13	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	26	5	5	36	4.8

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
32	1	1	2	S	L	N	L	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	5	5	15	4.5
33	1	1	3	C	L	S	L	1	2	1	0	0	0	0	7	7	4	13	0	3	13	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	49	11	4	64	8.7
34	1	1	3	S	L	N	L	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	9	0	13	16.9
35	1	1	3	C	L	N	L	1	0	0	0	0	0	0	3	4	1	3	0	5	5	1	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23	10	1	34	13.1
36	1	1	3	S	L	S	L	1	0	0	0	0	0	0	2	1	0	0	0	1	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	6	1	12	18.0
37	1	1	3	S	H	S	L	0	0	0	0	0	5	0	5	4	6	0	0	1	0	8	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	24	14	5	43	11.1
38	1	1	3	C	H	S	L	1	5	5	0	0	4	2	8	5	3	4	0	2	6	9	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	37	28	17	82	22.0
39	1	1	3	S	H	N	L	1	0	0	0	0	0	0	3	1	0	0	1	0	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6	14	1	21	33.9
40	1	1	3	S	L	N	H	3	0	0	0	0	0	0	4	5	0	0	1	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	10	3	23	10.4
41	1	1	3	S	H	N	H	0	0	0	0	0	3	0	11	2	0	0	0	0	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	15	23	3	41	12.2
42	1	1	3	C	H	S	H	2	5	11	0	1	6	3	5	6	3	5	0	2	8	8	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	37	17	28	82	15.9
43	1	1	3	S	H	S	H	2	0	0	0	0	4	0	6	5	0	0	0	4	0	9	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	24	14	6	44	10.9
44	1	1	3	C	L	N	H	1	4	3	0	0	4	0	3	6	0	11	0	3	18	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	43	22	12	77	10.9
45	1	1	3	C	H	N	H	2	1	3	0	0	0	1	8	3	2	5	0	1	7	4	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	30	20	7	57	17.8
46	1	1	3	S	L	S	H	2	0	0	0	0	2	0	15	11	3	0	0	5	0	9	2	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	45	35	4	84	14.9
47	1	1	3	C	H	N	L	1	6	1	0	0	5	0	6	4	3	4	0	0	4	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21	15	13	49	15.4
48	1	1	3	C	L	S	H	1	2	3	0	0	1	0	18	6	1	10	0	0	10	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	47	16	7	70	8.4
49	1	1	4	S	L	S	L	1	0	0	0	0	0	0	11	7	6	0	0	1	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	25	15	1	41	8.1
50	1	1	4	S	H	N	L	5	0	0	0	0	2	0	12	5	2	0	1	1	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23	36	7	66	20.9
51	1	1	4	S	L	N	L	3	0	0	0	0	1	0	2	5	0	0	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7	12	4	23	13.6
52	1	1	4	C	H	S	L	1	4	1	0	0	0	1	4	0	0	0	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4	3	7	14	5.6
53	1	1	4	C	L	N	H	1	1	0	0	0	3	0	5	5	1	7	0	1	16	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	35	14	5	54	7.9
54	1	1	4	S	H	S	H	2	0	0	0	0	1	0	21	13	4	0	0	3	0	5	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	46	48	3	97	14.1
55	1	1	4	C	H	N	H	2	7	3	0	0	5	1	11	11	8	18	0	2	17	5	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	72	41	18	131	16.6
56	1	1	4	C	L	N	L	1	1	1	0	0	2	0	0	3	0	6	1	0	13	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	23	15	5	43	8.3
57	1	1	4	S	L	N	H	4	0	0	0	0	0	0	5	9	1	0	2	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	17	7	4	28	6.2
58	1	1	4	S	L	S	H	2	0	0	0	2	0	0	17	6	6	0	0	3	0	7	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	39	33	4	76	13.5
59	1	1	4	C	L	S	L	2	4	6	0	0	1	1	7	10	3	10	0	1	11	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	44	17	14	75	12.7
60	1	1	4	S	H	N	H	4	0	0	0	0	1	0	8	12	2	6	0	0	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	29	51	5	85	27.2
61	1	1	4	C	H	N	L	1	4	5	0	0	3	1	6	4	1	4	0	2	7	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	25	20	14	59	19.9
62	1	1	4	C	H	S	H	3	12	14	0	0	3	4	22	8	6	6	0	4	11	8	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	65	44	36	145	17.6
63	1	1	4	S	H	S	L	0	0	0	0	0	3	0	13	6	5	0	0	1	0	8	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	33	38	3	74	18.0
64	1	1	4	C	L	S	H	0	8	2	0	0	2	0	15	15	6	13	0	2	12	5	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	68	27	12	107	12.7
65	1	1	5	S	L	N	L	3	0	0	0	0	0	0	3	8	1	0	1	0	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14	9	3	26	8.0
66	1	1	5	S	H	S	H	3	0	0	0	0	4	0	14	13	10	0	0	6	0	14	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	57	47	7	111	17.1

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
67	1	1	5	S	L	N	H	2	0	0	0	0	1	0	3	11	2	0	0	0	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	17	18	3	38	10.3
68	1	1	5	C	H	S	H	3	7	10	0	0	4	6	13	6	5	13	0	5	13	11	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	67	47	30	144	22.4
69	1	1	5	S	H	S	L	6	0	0	0	0	1	0	8	12	5	0	0	0	0	11	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	36	34	7	77	15.2
70	1	1	5	S	H	N	H	5	0	0	0	0	1	0	10	11	4	0	0	1	0	5	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	31	41	6	78	21.1
71	1	1	5	C	H	N	L	0	6	0	0	0	2	0	7	4	0	2	0	0	5	0	2	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	20	16	8	44	14.0
72	1	1	5	S	L	S	H	4	0	0	0	0	0	0	18	9	7	0	0	1	0	7	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	42	35	4	81	12.6
73	1	1	5	C	L	N	H	2	4	1	0	0	2	0	4	13	5	11	0	5	12	1	1	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	52	20	9	81	12.4
74	1	1	5	C	H	S	L	1	3	6	0	0	0	7	5	4	0	4	0	1	1	4	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	19	16	17	52	15.9
75	1	1	5	C	L	S	L	0	3	3	0	0	0	1	9	5	1	9	0	2	6	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	34	10	7	51	10.4
76	1	1	5	S	H	N	L	2	0	0	0	0	4	0	8	5	1	0	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14	19	6	39	13.8
77	1	1	5	C	H	N	H	0	6	3	0	0	5	1	3	4	5	10	0	0	10	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	33	16	15	64	12.7
78	1	1	5	S	L	S	L	0	0	0	0	0	3	0	10	5	4	0	2	2	0	5	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	28	20	3	51	14.2
79	1	1	5	C	L	S	H	3	3	6	0	0	3	1	8	4	10	8	0	3	15	5	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	53	25	16	94	15.6
80	1	1	5	C	L	N	L	1	2	0	0	0	0	0	1	7	0	5	0	0	8	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21	10	3	34	8.0
1	2	1	1	C	H	S	H	7	0	0	0	0	0	0	4	4	3	16	0	0	9	7	0	0	0	1	9	0	0	0	4	6	43	20	7	70	8.0
2	2	1	1	C	H	N	H	6	0	0	0	0	2	0	12	11	2	15	0	0	11	0	4	0	0	1	4	0	0	0	5	4	55	14	8	77	8.1
3	2	1	1	S	L	S	L	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2	2	1	5	3.6
4	2	1	1	S	L	N	L	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4	2.0
5	2	1	1	S	H	S	L	5	0	2	0	0	3	0	4	3	8	0	0	5	0	1	4	0	2	1	4	0	1	0	6	0	25	14	10	49	10.6
6	2	1	1	S	H	S	H	1	0	0	0	0	0	0	10	5	5	0	0	3	2	3	0	0	2	0	2	0	1	0	4	0	28	9	1	38	7.3
7	2	1	1	C	H	S	L	1	3	4	0	0	0	1	5	2	3	5	0	0	0	3	3	0	0	0	5	0	0	0	2	3	21	10	9	40	11.0
8	2	1	1	C	L	S	H	1	1	1	0	0	1	0	6	4	0	11	0	0	17	1	0	0	0	1	2	0	0	0	2	1	39	6	4	49	5.0
9	2	1	1	C	L	S	H	1	0	5	0	0	0	0	5	3	0	4	0	9	6	0	0	0	0	0	0	0	1	0	0	0	27	1	6	34	6.0
10	2	1	1	C	L	N	H	0	0	0	0	0	0	0	1	1	0	2	0	3	7	0	0	0	0	0	0	0	0	0	0	1	14	1	0	15	3.5
11	2	1	1	S	H	N	L	5	0	4	0	0	1	0	8	5	4	0	0	8	2	0	0	0	3	3	4	0	0	0	3	0	27	13	10	50	9.7
12	2	1	1	C	L	N	L	2	0	0	0	0	0	0	4	3	2	2	0	2	19	0	1	0	0	0	1	0	0	0	1	2	33	4	2	39	3.7
13	2	1	1	C	H	N	L	1	1	0	0	0	3	0	5	2	1	6	0	3	10	2	4	0	0	2	2	0	0	0	5	3	33	12	5	50	10.1
14	2	1	1	S	H	N	H	5	0	0	0	0	2	0	6	0	2	0	0	3	2	4	13	0	1	2	5	0	4	0	4	1	30	17	7	54	8.8
15	2	1	1	S	L	S	H	0	0	0	0	0	1	0	15	6	3	0	0	1	0	1	2	0	0	2	2	0	0	0	1	0	28	5	1	34	4.0
16	2	1	1	S	L	N	H	3	0	0	0	0	3	0	4	7	2	0	0	2	0	0	1	0	2	0	2	0	1	0	1	1	16	7	6	29	8.2
17	2	1	2	S	L	S	H	5	0	0	0	0	0	0	8	13	3	11	0	6	0	2	0	0	2	2	5	0	4	0	10	0	43	23	5	71	8.7
18	2	1	2	C	H	N	L	2	0	0	0	0	0	0	6	0	2	0	0	0	25	0	0	0	2	5	5	0	2	0	6	3	33	23	2	58	4.4
19	2	1	2	S	H	S	H	0	0	0	0	0	3	0	10	4	5	0	0	0	1	8	0	0	1	5	5	0	3	0	9	0	28	23	3	54	8.2
20	2	1	2	C	L	N	H	1	0	0	0	0	0	0	6	3	0	6	0	0	16	0	0	0	1	0	1	0	0	0	7	1	31	10	1	42	4.5
21	2	1	2	S	H	N	H	2	0	0	0	0	6	0	8	7	2	0	0	2	0	0	0	0	3	3	8	0	5	0	7	0	19	26	8	53	8.9

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
22	2	1	2	S	L	N	H	3	0	0	0	0	0	0	4	9	8	0	0	1	0	0	0	0	5	0	4	0	4	0	11	0	22	24	3	49	6.9
23	2	1	2	S	H	S	L	0	0	0	0	0	2	0	6	6	0	0	0	0	0	8	0	0	2	5	3	0	6	0	9	0	20	25	2	47	7.5
24	2	1	2	C	H	N	H	9	8	0	0	0	3	0	9	9	3	6	0	0	8	2	0	0	2	4	6	0	7	0	3	6	37	28	20	85	12.5
25	2	1	2	C	L	S	H	3	0	0	0	0	0	0	13	5	2	12	0	0	14	4	2	0	1	1	0	0	3	0	5	1	52	11	3	66	7.2
26	2	1	2	C	L	S	L	3	3	3	0	0	0	0	7	3	5	9	0	0	11	4	0	0	4	0	3	0	0	0	1	5	39	13	9	61	9.8
27	2	1	2	S	H	N	L	3	0	0	0	0	2	0	5	6	4	0	0	1	0	0	2	0	4	4	2	0	3	0	11	0	18	24	5	47	8.5
28	2	1	2	C	H	S	L	0	2	6	0	0	2	6	9	5	4	9	0	1	7	8	0	0	1	2	3	0	5	0	6	4	43	21	16	80	13.1
29	2	1	2	C	H	S	H	5	8	7	0	0	1	13	11	8	7	19	0	0	11	14	2	0	2	2	2	0	2	0	12	9	72	29	34	135	12.4
30	2	1	2	S	L	S	L	2	0	0	0	0	4	0	5	6	6	0	0	0	0	2	2	0	1	2	4	0	4	0	10	0	21	21	6	48	8.8
31	2	1	2	C	L	N	L	4	1	0	0	0	0	0	0	6	9	0	0	0	23	0	0	0	1	0	2	0	0	0	2	0	38	5	5	48	3.4
32	2	1	2	S	L	N	L	7	0	1	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	7	5	8	20	4.2
33	2	1	3	C	L	S	L	1	0	0	0	0	0	0	9	7	6	17	0	0	18	2	0	0	0	0	0	0	0	0	8	2	59	10	1	70	5.8
34	2	1	3	S	L	N	L	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	5	0	0	0	3	0	0	0	2	1	9	6	0	15	4.6
35	2	1	3	C	L	N	L	1	0	0	0	0	0	0	1	3	2	5	0	5	11	1	0	0	0	1	1	0	0	0	3	2	28	7	1	36	6.4
36	2	1	3	S	L	S	L	1	0	0	0	0	0	0	2	2	0	0	0	0	0	1	0	0	1	1	1	0	0	0	4	0	5	7	1	13	5.8
37	2	1	3	S	H	S	L	1	0	0	0	0	0	2	3	8	5	0	0	0	0	6	0	0	2	3	1	0	3	0	4	1	22	14	3	39	8.5
38	2	1	3	C	H	S	L	2	0	3	0	0	1	0	6	2	2	5	0	0	5	6	1	0	1	1	7	0	1	0	4	8	27	22	6	55	10.9
39	2	1	3	S	H	N	L	1	0	0	0	0	0	0	3	17	1	0	0	0	0	2	1	0	1	2	5	0	1	0	4	0	24	13	1	38	4.1
40	2	1	3	S	L	N	H	2	0	0	0	0	0	0	4	6	0	0	0	0	0	0	1	0	3	0	3	0	1	0	2	0	11	9	2	22	6.1
41	2	1	3	S	H	N	H	0	0	0	0	0	2	0	8	5	0	0	0	2	3	0	0	0	5	0	3	0	0	0	9	0	18	17	2	37	6.2
42	2	1	3	C	H	S	H	1	3	6	0	0	4	6	4	4	2	7	0	0	5	8	1	0	0	0	2	0	0	0	3	4	31	9	20	60	11.9
43	2	1	3	S	H	S	H	4	0	1	0	0	4	0	2	5	0	0	0	1	1	5	1	0	2	1	2	0	2	0	8	0	15	15	9	39	9.1
44	2	1	3	C	L	N	H	0	3	0	0	0	4	0	1	4	0	8	0	1	15	1	0	0	1	1	5	0	2	0	4	5	30	18	7	55	7.5
45	2	1	3	C	H	N	H	5	2	1	0	0	3	0	8	3	1	4	0	0	3	2	0	0	3	1	6	0	0	0	1	2	21	13	11	45	10.5
46	2	1	3	S	L	S	H	0	0	0	0	0	1	0	8	12	3	0	0	2	0	5	1	0	2	4	3	0	5	0	6	1	31	21	1	53	8.3
47	2	1	3	C	H	N	L	0	6	0	0	0	2	0	5	4	2	5	0	0	7	1	2	0	0	1	2	0	4	0	1	4	26	12	8	46	10.5
48	2	1	3	C	L	S	H	1	0	5	0	0	0	0	15	7	1	8	0	0	10	3	0	0	1	1	1	0	3	0	3	3	44	12	6	62	7.6
49	2	1	4	S	L	S	L	3	0	0	0	0	2	0	5	7	4	0	0	0	1	3	0	0	0	6	7	0	0	0	3	0	20	16	5	41	8.1
50	2	1	4	S	H	N	L	8	0	0	0	0	2	0	3	9	3	0	0	0	0	0	0	0	1	7	8	0	4	0	5	0	15	25	10	50	7.8
51	2	1	4	S	L	N	L	5	0	0	0	0	2	0	0	5	0	0	0	0	0	0	0	0	0	2	3	0	1	0	5	0	5	11	7	23	5.7
52	2	1	4	C	H	S	L	3	3	2	0	0	1	0	4	5	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	9	3	9	21	6.6
53	2	1	4	C	L	N	H	0	0	0	0	0	1	0	3	4	2	13	0	2	15	0	1	0	0	0	4	0	1	0	4	4	40	13	1	54	6.1
54	2	1	4	S	H	S	H	4	0	0	0	0	0	0	6	8	1	0	0	0	0	6	0	0	8	6	5	0	3	0	15	0	21	37	4	62	7.5
55	2	1	4	C	H	N	H	9	7	0	0	0	8	0	7	7	8	15	0	0	16	4	0	0	1	1	5	0	1	0	9	6	57	23	24	104	10.8
56	2	1	4	C	L	N	L	1	0	0	0	0	3	0	0	3	0	6	0	0	18	0	0	0	1	0	2	0	1	0	5	4	27	13	4	44	4.5

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
57	2	1	4	S	L	N	H	9	0	0	0	0	0	0	3	11	1	0	0	0	0	0	0	0	2	0	1	0	1	0	4	0	15	8	9	32	4.4
58	2	1	4	S	L	S	H	2	0	1	0	0	0	0	10	4	3	0	0	0	0	4	0	0	6	1	4	0	4	0	10	0	21	25	3	49	7.6
59	2	1	4	C	L	S	L	3	2	4	0	0	0	2	4	5	1	10	0	0	10	4	0	0	1	0	5	0	5	0	4	6	34	21	11	66	11.1
60	2	1	4	S	H	N	H	10	0	0	0	0	1	0	6	13	1	0	0	0	0	4	0	0	5	10	4	0	3	0	16	0	24	38	11	73	7.3
61	2	1	4	C	H	N	L	1	1	4	0	0	2	2	3	0	0	4	0	0	6	2	0	0	0	3	6	0	2	0	3	5	15	19	10	44	11.1
62	2	1	4	C	H	S	H	2	3	3	0	0	3	13	15	1	3	8	0	0	7	12	0	0	0	6	5	0	5	0	4	12	46	32	24	102	11.1
63	2	1	4	S	H	S	L	2	0	0	0	0	2	0	6	4	6	0	0	1	0	6	2	0	2	8	11	0	7	0	9	0	25	37	4	66	9.6
64	2	1	4	C	L	S	H	1	3	4	0	0	2	0	6	9	8	13	0	0	10	6	0	0	4	1	3	0	1	0	4	9	52	22	10	84	11.0
65	2	1	5	S	L	N	L	2	0	0	0	0	0	0	5	4	1	0	0	0	0	0	0	0	4	0	2	0	2	0	2	0	10	10	2	22	6.5
66	2	1	5	S	H	S	H	8	0	0	0	0	2	0	7	12	8	0	0	0	0	15	0	0	3	10	3	0	9	0	14	0	42	39	10	91	8.8
67	2	1	5	S	L	N	H	1	0	0	0	0	0	0	2	11	2	0	0	0	0	0	0	0	3	1	5	0	4	0	6	0	15	19	1	35	5.6
68	2	1	5	C	H	S	H	4	3	9	0	0	3	12	11	3	2	8	0	3	8	11	0	0	5	2	10	0	2	0	7	5	46	31	31	108	13.6
69	2	1	5	S	H	S	L	6	0	1	0	0	1	0	5	10	5	0	0	0	0	6	0	0	1	0	13	0	1	0	4	0	26	19	8	53	6.8
70	2	1	5	S	H	N	H	5	0	0	0	0	4	0	7	11	4	0	0	0	0	3	0	0	2	0	13	0	0	0	5	0	25	20	9	54	6.7
71	2	1	5	C	H	N	L	0	5	0	0	0	2	0	7	5	0	2	0	0	6	0	11	0	3	1	1	0	3	0	2	3	31	13	7	51	8.8
72	2	1	5	S	L	S	H	2	0	0	0	0	0	0	11	10	9	0	0	0	0	7	0	0	1	2	8	0	6	0	9	0	37	26	2	65	7.8
73	2	1	5	C	L	N	H	3	0	2	0	0	1	0	2	9	2	15	0	0	15	2	0	0	6	0	8	0	5	0	6	5	45	30	6	81	8.8
74	2	1	5	C	H	S	L	2	4	6	0	0	2	8	5	2	0	3	0	0	3	5	1	0	3	0	4	0	1	0	4	1	19	13	22	54	12.2
75	2	1	5	C	L	S	L	1	1	3	0	0	0	0	3	8	0	9	0	0	12	2	0	0	0	0	5	0	1	0	3	2	34	11	5	50	7.1
76	2	1	5	S	H	N	L	4	0	0	0	0	3	0	6	4	2	0	0	0	0	0	0	0	0	4	3	0	7	0	6	0	12	20	7	39	8.0
77	2	1	5	C	H	N	H	0	5	4	0	0	5	0	1	8	3	9	0	0	7	4	0	0	0	2	5	0	1	0	2	7	32	17	14	63	10.8
78	2	1	5	S	L	S	L	0	0	0	0	0	1	0	6	5	4	1	0	0	0	5	0	0	0	7	5	0	1	0	8	1	21	22	1	44	7.9
79	2	1	5	C	L	S	H	2	4	5	0	0	2	3	2	4	6	6	0	0	13	4	4	0	3	3	6	0	4	0	4	5	39	25	16	80	13.9
80	2	1	5	C	L	N	L	1	0	0	0	0	0	0	0	3	0	5	0	0	14	0	0	0	0	0	5	0	2	0	4	3	22	14	1	37	4.8
1	2	2	1	C	H	S	H	4	2	3	0	0	0	0	2	4	2	13	0	0	8	7	0	0	0	1	9	0	0	0	4	10	36	24	9	69	8.9
2	2	2	1	C	H	N	H	9	2	1	0	0	1	0	9	8	2	11	0	0	15	0	6	0	2	2	8	0	1	0	7	4	51	24	13	88	10.2
3	2	2	1	S	L	S	L	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	2	4	1	7	4.5
4	2	2	1	S	L	N	L	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4	2.0
5	2	2	1	S	H	S	L	6	0	0	0	0	3	0	4	5	6	0	0	3	0	1	7	0	2	1	1	0	4	0	7	1	26	16	9	51	10.3
6	2	2	1	S	H	S	H	1	0	0	0	0	0	0	8	5	5	0	0	1	3	3	0	0	1	1	3	0	4	0	5	0	25	14	1	40	8.6
7	2	2	1	C	H	S	L	0	3	5	0	0	0	0	5	2	3	7	0	0	0	2	2	0	0	0	6	0	2	0	3	4	21	15	8	44	10.0
8	2	2	1	C	L	S	H	0	1	2	0	0	0	0	9	8	0	0	10	0	14	1	0	0	0	1	3	0	0	0	2	1	42	7	3	52	5.9
9	2	2	1	C	L	S	H	1	0	4	0	0	0	0	9	2	0	3	0	1	4	0	0	0	0	0	0	0	0	0	1	0	19	1	5	25	4.8
10	2	2	1	C	L	N	H	0	0	0	0	0	0	0	1	1	0	2	0	1	6	0	0	0	0	0	0	0	1	0	0	0	11	1	0	12	3.3
11	2	2	1	S	H	N	L	7	0	0	0	0	1	0	7	6	3	0	0	0	0	0	1	0	1	6	9	0	1	0	6	1	17	24	8	49	8.0

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
12	2	2	1	C	L	N	L	2	0	0	0	0	0	0	0	4	2	2	0	0	17	0	0	0	0	0	1	0	0	0	1	2	25	4	2	31	3.0
13	2	2	1	C	H	N	L	2	3	0	0	0	4	0	4	3	1	5	0	2	10	2	7	0	1	0	4	0	2	0	7	4	34	18	9	61	11.5
14	2	2	1	S	H	N	H	11	0	0	0	0	2	0	5	3	4	0	0	2	0	3	12	0	1	4	7	0	7	0	11	1	29	31	13	73	9.4
15	2	2	1	S	L	S	H	0	0	0	0	0	1	0	13	4	4	0	0	0	0	1	0	0	0	1	2	0	0	0	1	0	22	4	1	27	3.5
16	2	2	1	S	L	N	H	4	0	0	0	0	2	0	2	9	2	0	0	0	0	0	0	0	1	0	5	0	2	0	1	1	13	10	6	29	6.0
17	2	2	2	S	L	S	H	2	0	0	0	0	0	0	6	11	2	0	0	0	0	2	6	0	3	3	3	0	5	0	7	0	27	21	2	50	8.2
18	2	2	2	C	H	N	L	0	3	3	0	0	3	0	3	1	2	4	0	0	11	0	0	0	1	7	6	0	4	0	6	3	21	27	9	57	10.0
19	2	2	2	S	H	S	H	0	0	0	0	0	3	0	5	5	4	0	0	0	0	6	0	0	0	5	4	0	4	0	7	0	20	20	3	43	8.5
20	2	2	2	C	L	N	H	1	0	2	0	0	0	0	2	3	0	5	0	0	12	0	0	0	0	0	1	0	0	0	7	1	22	9	3	34	4.9
21	2	2	2	S	H	N	H	4	0	0	0	0	5	0	4	9	2	0	0	1	0	2	0	0	2	3	7	0	6	0	10	0	18	28	9	55	8.8
22	2	2	2	S	L	N	H	4	0	1	0	0	0	0	4	7	5	0	0	0	0	0	0	0	4	0	5	0	3	0	6	0	16	18	5	39	7.9
23	2	2	2	S	H	S	L	0	0	0	0	0	2	0	5	6	0	0	0	0	0	5	0	0	3	5	3	0	5	0	10	0	16	26	2	44	7.5
24	2	2	2	C	H	N	H	4	5	0	0	0	2	0	6	6	2	5	0	0	5	3	0	0	3	3	7	0	8	0	5	6	27	32	11	70	13.2
25	2	2	2	C	L	S	H	2	0	0	0	0	0	0	9	2	1	8	0	0	8	4	1	0	0	1	0	0	3	0	5	2	33	11	2	46	7.7
26	2	2	2	C	L	S	L	2	2	6	0	0	0	0	7	4	3	8	0	0	9	3	0	0	3	0	4	0	0	0	1	4	34	12	10	56	10.0
27	2	2	2	S	H	N	L	0	0	0	0	0	3	0	5	7	6	0	0	0	0	0	3	0	5	4	4	0	5	0	8	0	21	26	3	50	9.1
28	2	2	2	C	H	S	L	0	5	8	0	0	1	7	8	4	4	9	0	1	6	8	3	0	0	2	4	0	4	0	2	7	43	19	21	83	13.4
29	2	2	2	C	H	S	H	1	13	5	0	0	3	10	4	4	3	11	0	0	7	9	0	0	2	5	4	0	4	0	6	12	38	33	32	103	12.7
30	2	2	2	S	L	S	L	2	0	0	0	0	2	0	4	6	7	0	0	0	0	3	4	0	1	5	5	0	4	0	9	0	24	24	4	52	9.6
31	2	2	2	C	L	N	L	3	1	0	0	0	0	0	1	3	0	8	0	0	12	0	0	0	1	0	2	0	0	0	2	0	24	5	4	33	4.6
32	2	2	2	S	L	N	L	6	0	0	0	0	0	0	1	8	0	0	0	0	0	0	0	0	0	0	4	0	1	0	2	0	9	7	6	22	4.0
33	2	2	3	C	L	S	L	3	0	0	0	0	0	0	9	6	5	14	0	0	14	1	3	0	0	0	3	0	0	0	7	3	52	13	3	68	7.5
34	2	2	3	S	L	N	L	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	5	0	0	0	2	0	0	0	3	1	9	6	0	15	4.6
35	2	2	3	C	L	N	L	1	0	0	0	0	0	0	1	4	2	3	0	0	9	1	0	0	0	1	1	0	0	0	3	4	20	9	1	30	6.4
36	2	2	3	S	L	S	L	0	0	0	0	0	0	0	1	2	0	0	0	0	0	1	0	0	0	1	1	0	0	0	4	0	4	6	0	10	4.2
37	2	2	3	S	H	S	L	1	0	0	0	0	4	0	3	11	5	0	0	0	0	7	0	0	2	3	3	0	2	0	3	1	26	14	5	45	7.9
38	2	2	3	C	H	S	L	3	0	3	0	0	2	0	4	3	1	4	0	0	3	7	2	0	2	2	8	0	1	0	3	9	24	25	8	57	11.2
39	2	2	3	S	H	N	L	1	0	0	0	0	0	0	4	15	0	0	0	0	0	2	0	0	2	3	4	0	1	0	3	0	21	13	1	35	4.3
40	2	2	3	S	L	N	H	1	0	0	0	0	0	0	5	4	0	0	0	0	0	0	1	0	2	0	4	0	2	0	2	0	10	10	1	21	6.2
41	2	2	3	S	H	N	H	0	0	0	0	0	3	0	6	10	0	0	0	0	3	1	0	0	3	0	7	0	1	0	10	0	20	21	3	44	6.2
42	2	2	3	C	H	S	H	0	4	8	0	0	9	10	3	6	0	7	0	0	4	7	3	0	3	0	5	0	5	0	4	7	30	24	31	85	13.1
43	2	2	3	S	H	S	H	3	0	3	0	0	4	0	5	5	0	0	0	3	0	3	2	0	2	0	2	0	6	0	8	0	18	18	10	46	9.9
44	2	2	3	C	L	N	H	0	3	2	0	0	4	0	1	5	0	9	0	0	13	0	0	0	0	0	6	0	3	0	4	8	28	21	9	58	7.8
45	2	2	3	C	H	N	H	3	3	3	0	0	4	0	7	2	1	6	0	0	2	4	0	0	3	1	7	0	3	0	0	4	22	18	13	53	11.9
46	2	2	3	S	L	S	H	3	0	0	0	0	0	0	9	10	6	0	0	0	0	8	0	0	4	3	3	0	8	0	10	2	33	30	3	66	8.9

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
47	2	2	3	C	H	N	L	0	6	0	0	0	2	0	3	6	2	2	0	0	5	0	1	0	0	1	1	0	4	0	0	4	19	10	8	37	8.9
48	2	2	3	C	L	S	H	0	0	5	0	0	0	0	8	8	1	5	0	0	12	1	0	0	2	1	1	0	4	0	2	4	35	14	5	54	8.0
49	2	2	4	S	L	S	L	3	0	0	0	0	1	0	8	5	5	0	0	0	0	2	0	0	0	4	8	0	2	0	1	0	20	15	4	39	7.1
50	2	2	4	S	H	N	L	5	0	0	0	0	2	0	1	5	1	0	0	0	0	0	0	0	3	4	7	0	9	0	6	0	7	29	7	43	7.5
51	2	2	4	S	L	N	L	4	0	0	0	0	3	0	1	4	0	0	0	0	0	0	0	0	0	3	3	0	3	0	5	0	5	14	7	26	7.2
52	2	2	4	C	H	S	L	2	3	4	0	0	0	0	5	6	0	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	11	3	9	23	5.6
53	2	2	4	C	L	N	H	0	0	0	0	0	1	0	3	5	1	10	0	0	7	0	3	0	0	0	2	0	0	0	3	4	29	9	1	39	6.8
54	2	2	4	S	H	S	H	4	0	0	0	0	0	0	7	8	4	0	0	0	0	8	0	0	5	10	4	0	8	0	12	0	27	39	4	70	8.8
55	2	2	4	C	H	N	H	6	5	1	0	0	7	0	3	5	7	9	0	0	4	2	0	0	1	1	9	0	1	0	4	10	30	26	19	75	11.4
56	2	2	4	C	L	N	L	1	1	1	0	0	2	0	0	3	0	5	0	0	13	0	0	0	2	1	1	0	2	0	4	3	21	13	5	39	6.2
57	2	2	4	S	L	N	H	7	0	0	0	0	0	0	2	8	1	0	0	0	0	0	0	0	2	0	1	0	0	0	3	0	11	6	7	24	4.4
58	2	2	4	S	L	S	H	3	0	0	0	0	0	0	7	4	4	0	0	0	0	5	1	0	5	3	2	0	6	0	6	0	21	22	3	46	9.4
59	2	2	4	C	L	S	L	3	2	3	0	0	0	2	2	5	2	10	0	0	6	4	0	0	0	2	4	0	3	0	3	6	29	18	10	57	11.4
60	2	2	4	S	H	N	H	5	0	0	0	0	0	0	5	7	0	0	0	0	0	2	0	0	6	4	4	0	6	0	7	0	14	27	5	46	8.3
61	2	2	4	C	H	N	L	3	1	5	0	0	0	2	6	1	1	3	0	0	4	1	0	0	0	1	3	0	3	0	3	4	16	14	11	41	11.4
62	2	2	4	C	H	S	H	0	0	5	0	0	2	14	12	0	3	5	0	0	1	10	0	0	0	4	9	0	6	0	2	12	31	33	21	85	9.2
63	2	2	4	S	H	S	L	2	0	0	0	0	3	0	4	1	4	0	0	0	0	7	1	0	1	9	9	0	7	0	5	0	17	31	5	53	8.4
64	2	2	4	C	L	S	H	0	1	5	0	0	2	0	7	13	4	8	0	0	6	3	0	0	3	1	4	0	3	0	2	10	41	23	8	72	10.1
65	2	2	5	S	L	N	L	1	0	0	0	0	0	0	4	8	1	0	0	0	0	0	0	0	2	0	5	0	1	0	0	0	13	8	1	22	4.3
66	2	2	5	S	H	S	H	4	0	0	0	0	2	0	9	15	14	0	0	0	0	15	0	0	3	6	9	0	7	0	10	3	53	38	6	97	9.1
67	2	2	5	S	L	N	H	1	0	0	0	0	0	0	3	10	1	0	0	0	0	2	0	0	2	0	4	0	5	0	6	0	16	17	1	34	5.9
68	2	2	5	C	H	S	H	1	1	11	0	0	3	16	12	6	6	13	0	3	13	13	1	0	2	7	6	0	3	0	2	7	67	27	32	126	12.5
69	2	2	5	S	H	S	L	6	0	0	0	0	1	0	4	7	3	0	0	0	0	7	0	0	3	0	9	0	3	0	7	0	21	22	7	50	8.1
70	2	2	5	S	H	N	H	6	0	0	0	0	3	0	8	10	5	0	0	0	0	3	0	0	0	1	11	0	1	0	5	4	26	22	9	57	8.0
71	2	2	5	C	H	N	L	1	5	0	0	0	2	0	4	11	0	2	0	0	6	0	8	0	2	1	4	0	3	0	1	0	31	11	8	50	8.3
72	2	2	5	S	L	S	H	2	0	0	0	0	0	0	6	12	8	0	0	0	0	6	0	0	2	1	11	0	5	0	6	0	32	25	2	59	7.4
73	2	2	5	C	L	N	H	1	0	3	0	0	1	0	1	5	0	12	0	0	11	1	0	0	6	0	6	0	5	0	7	3	30	27	5	62	8.4
74	2	2	5	C	H	S	L	2	2	15	0	0	1	9	4	5	0	1	0	1	1	6	0	0	3	0	5	0	4	0	2	0	18	14	29	61	8.3
75	2	2	5	C	L	S	L	0	1	2	0	0	0	0	4	6	0	7	0	0	7	2	0	0	0	0	6	0	6	0	1	2	26	15	3	44	8.2
76	2	2	5	S	H	N	L	3	0	2	0	0	3	0	6	2	2	0	0	0	0	0	0	0	0	2	5	0	8	0	5	0	10	20	8	38	7.8
77	2	2	5	C	H	N	H	0	4	4	0	0	7	0	2	4	4	6	0	0	5	1	0	0	0	1	5	0	1	0	1	6	22	14	15	51	10.7
78	2	2	5	S	L	S	L	0	0	0	0	0	2	0	8	4	2	1	0	0	0	5	0	0	1	5	3	0	2	0	5	1	20	17	2	39	8.5
79	2	2	5	C	L	S	H	1	4	3	0	0	0	2	0	4	8	4	0	0	10	3	3	0	1	4	4	0	2	0	4	6	32	21	10	63	11.9
80	2	2	5	C	L	N	L	1	1	0	0	0	2	0	1	4	0	4	0	0	11	0	0	0	0	0	2	0	3	0	2	4	20	11	4	35	6.3
1	2	3	1	C	H	S	H	3	0	3	0	0	0	0	3	4	2	10	0	0	5	3	0	0	0	0	6	0	0	0	1	9	27	16	6	49	8.0

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
2	2	3	1	C	H	N	H	5	1	4	0	0	3	0	6	8	3	7	0	0	9	0	5	0	1	2	7	0	0	0	4	3	38	17	13	68	11.7
3	2	3	1	S	L	S	L	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	2	3	1	6	3.6
4	2	3	1	S	L	N	L	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4	2.0
5	2	3	1	S	H	S	L	7	0	2	0	0	2	0	0	3	4	0	0	3	0	1	5	0	2	2	5	0	3	0	5	0	16	17	11	44	10.5
6	2	3	1	S	H	S	H	1	0	0	0	0	0	0	5	4	4	0	0	0	0	1	1	0	1	1	7	0	5	0	1	1	15	16	1	32	7.4
7	2	3	1	C	H	S	L	0	4	5	0	0	1	1	4	2	2	5	0	0	0	2	2	0	0	0	9	0	2	0	1	6	17	18	11	46	9.5
8	2	3	1	C	L	S	H	0	1	4	0	0	1	0	3	5	0	9	0	0	14	0	0	0	0	0	3	0	0	0	4	2	31	9	6	46	5.9
9	2	3	1	C	L	S	H	1	0	6	0	0	0	0	3	2	0	4	0	1	3	0	2	0	0	0	0	0	1	0	0	0	15	1	7	23	6.5
10	2	3	1	C	L	N	H	0	0	0	0	0	0	0	1	2	0	2	0	0	4	0	1	0	0	0	0	0	1	0	0	0	10	1	0	11	4.5
11	2	3	1	S	H	N	L	8	0	4	0	0	3	0	5	5	3	0	0	0	1	0	4	0	0	5	8	0	4	0	6	0	18	23	15	56	10.2
12	2	3	1	C	L	N	L	2	0	0	0	0	0	0	1	3	0	2	0	0	12	0	3	0	0	0	1	0	0	0	0	2	21	3	2	26	3.8
13	2	3	1	C	H	N	L	3	6	0	0	0	5	0	2	2	0	5	0	3	8	0	6	0	2	1	1	0	2	0	3	4	26	13	14	53	11.4
14	2	3	1	S	H	N	H	6	0	0	0	0	2	0	6	2	3	0	0	0	0	2	12	0	1	1	10	0	4	0	4	3	25	23	8	56	8.3
15	2	3	1	S	L	S	H	0	0	0	0	0	2	0	10	6	3	0	0	2	0	2	2	0	0	2	1	0	1	0	3	0	25	7	2	34	6.6
16	2	3	1	S	L	N	H	3	0	0	0	0	2	0	2	8	2	0	0	0	0	0	0	0	1	0	3	0	1	0	1	1	12	7	5	24	5.9
17	2	3	2	S	L	S	H	5	0	0	0	0	0	0	7	10	2	0	0	0	0	2	0	0	3	2	3	0	5	0	7	0	21	20	5	46	7.6
18	2	3	2	C	H	N	L	0	4	1	0	0	3	0	2	1	1	6	0	0	8	1	0	0	0	4	6	0	3	0	6	5	19	24	8	51	10.2
19	2	3	2	S	H	S	H	0	0	0	0	0	5	0	3	6	4	0	0	0	0	9	4	0	0	5	5	0	8	0	6	0	26	24	5	55	9.1
20	2	3	2	C	L	N	H	0	0	3	0	0	0	0	3	3	0	5	0	0	11	0	1	0	0	0	2	0	0	0	5	2	23	9	3	35	5.9
21	2	3	2	S	H	N	H	4	0	0	0	0	4	0	3	13	2	0	0	2	0	1	0	0	7	2	6	0	6	0	8	0	21	29	8	58	8.2
22	2	3	2	S	L	N	H	3	0	0	0	0	0	0	4	9	5	0	0	0	0	0	0	0	6	0	6	0	3	0	7	0	18	22	3	43	7.1
23	2	3	2	S	H	S	L	1	0	0	0	0	2	0	3	5	2	0	0	0	0	6	0	0	2	7	4	0	7	0	9	0	16	29	3	48	8.3
24	2	3	2	C	H	N	H	3	6	3	0	0	2	0	0	6	2	3	0	0	6	0	0	0	2	2	5	0	11	0	3	8	17	31	14	62	10.4
25	2	3	2	C	L	S	H	3	0	0	0	0	0	0	7	3	1	6	0	0	9	3	3	0	1	0	0	0	4	0	5	2	32	12	3	47	8.9
26	2	3	2	C	L	S	L	2	2	5	0	0	0	0	5	3	6	7	0	0	7	4	0	0	2	0	5	0	0	0	1	5	32	13	9	54	10.7
27	2	3	2	S	H	N	L	2	1	0	0	0	4	0	3	7	5	0	0	1	0	0	4	0	6	1	4	0	5	0	7	0	20	23	7	50	10.1
28	2	3	2	C	H	S	L	0	7	3	0	0	2	13	4	2	1	5	0	1	2	6	0	0	3	1	4	0	4	0	2	8	21	22	25	68	10.8
29	2	3	2	C	H	S	H	0	4	8	0	0	6	13	0	2	1	14	0	0	3	13	0	0	1	3	6	0	7	0	5	9	33	31	31	95	10.4
30	2	3	2	S	L	S	L	2	0	0	0	0	2	0	4	8	6	0	0	0	0	2	0	0	1	4	3	0	3	0	9	0	20	20	4	44	7.9
31	2	3	2	C	L	N	L	2	1	0	0	0	0	0	1	3	0	8	0	0	12	0	0	0	1	0	3	0	0	0	1	0	24	5	3	32	4.4
32	2	3	2	S	L	N	L	4	0	5	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	4	0	2	0	1	0	6	7	9	22	5.5
33	2	3	3	C	L	S	L	1	0	2	0	0	0	0	5	5	5	13	0	0	11	2		0	0	0	6	0	1	0	2	5	41	14	3	58	7.6
34	2	3	3	S	L	N	L	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	5	0	0	1	3	0	0	0	3	1	8	8	0	16	4.7
35	2	3	3	C	L	N	L	0	0	0	0	0	0	0	1	5	1	4	0	0	11	1	0	0	0	1	1	0	0	0	2	3	23	7	0	30	5.0
36	2	3	3	S	L	S	L	1	0	0	0	0	0	0	1	6	0	0	0	0	0	1	0	0	0	1	2	0	0	0	4	0	8	7	1	16	4.3

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
37	2	3	3	S	H	S	L	0	0	0	0	0	4	0	5	9	4	0	0	0	0	6	0	0	2	4	4	0	2	0	2	0	24	14	4	42	8.1
38	2	3	3	C	H	S	L	2	1	6	0	0	1	1	7	3	2	5	0	0	4	5	1	0	2	1	12	0	0	0	3	7	27	25	11	63	10.5
39	2	3	3	S	H	N	L	1	0	0	0	0	0	0	2	14	1	0	0	0	0	2	3	0	2	2	4	0	2	0	3	0	22	13	1	36	5.1
40	2	3	3	S	L	N	H	2	0	0	0	0	0	0	3	5	0	0	0	0	0	0	1	0	3	0	4	0	1	0	2	0	9	10	2	21	6.4
41	2	3	3	S	H	N	H	0	0	1	0	0	3	0	4	4	0	0	0	0	2	2	0	0	3	0	7	0	2	0	6	0	12	18	4	34	7.8
42	2	3	3	C	H	S	H	0	4	9	0	0	7	13	0	5	1	8	0	0	3	8	0	0	4	0	2	0	3	0	6	9	25	24	33	82	10.8
43	2	3	3	S	H	S	H	3	0	1	0	0	4	0	3	4	0	0	0	2	0	5	0	0	1	2	3	0	5	0	6	0	14	17	8	39	9.8
44	2	3	3	C	L	N	H	0	1	2	0	0	2	0	2	6	0	12	0	0	8	0	0	0	0	1	5	0	2	0	3	5	28	16	5	49	7.5
45	2	3	3	C	H	N	H	0	2	5	0	0	6	0	5	1	0	5	0	0	1	4	0	0	2	2	6	0	1	0	2	4	16	17	13	46	10.7
46	2	3	3	S	L	S	H	2	0	0	0	0	0	0	6	8	2	0	0	0	0	6	0	0	4	2	3	0	7	0	7	0	22	23	2	47	8.2
47	2	3	3	C	H	N	L	0	7	0	0	0	1	0	2	4	2	3	0	0	3	1	0	0	0	2	1	0	4	0	1	7	15	15	8	38	8.8
48	2	3	3	C	L	S	H	0	1	3	0	0	0	0	5	4	1	6	0	0	8	1	0	0	1	0	2	0	5	0	1	3	25	12	4	41	8.7
49	2	3	4	S	L	S	L	2	0	0	0	0	1	0	5	7	4	0	0	0	2	0	0	0	0	2	9	0	1	0	0	0	18	12	3	33	5.9
50	2	3	4	S	H	N	L	5	0	0	0	0	3	0	1	7	1	0	0	0	0	0	0	0	2	8	7	0	4	0	3	0	9	24	8	41	7.4
51	2	3	4	S	L	N	L	2	0	0	0	0	2	0	1	6	0	0	0	0	0	0	0	0	0	2	5	0	1	0	4	0	7	12	4	23	5.8
52	2	3	4	C	H	S	L	2	3	4	0	0	2	0	4	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	5	4	11	20	6.7
53	2	3	4	C	L	N	H	0	0	0	0	0	1	0	1	3	1	10	0	1	7	0	2	0	0	0	4	0	1	0	3	4	25	12	1	38	6.9
54	2	3	4	S	H	S	H	0	0	0	0	0	0	0	6	5	4	0	0	0	0	5	0	0	5	6	9	0	8	0	12	0	20	40	0	60	8.0
55	2	3	4	C	H	N	H	0	4	3	0	0	7	0	5	1	5	10	0	0	9	1	0	0	0	1	5	0	0	0	3	8	31	17	14	62	9.5
56	2	3	4	C	L	N	L	1	0	0	0	0	2	0	0	2	0	7	0	0	9	0	0	0	1	1	1	0	2	0	6	3	18	14	3	35	6.4
57	2	3	4	S	L	N	H	5	0	0	0	0	0	0	4	12	0	0	0	0	0	0	0	0	2	0	2	0	0	0	3	0	16	7	5	28	3.9
58	2	3	4	S	L	S	H	0	0	0	0	0	0	0	5	5	4	0	0	0	0	2	0	0	3	2	2	0	3	0	4	0	16	14	0	30	8.0
59	2	3	4	C	L	S	L	3	4	4	0	0	1	2	4	0	1	6	0	0	4	3	0	0	1	1	5	0	4	0	3	6	18	20	14	52	12.8
60	2	3	4	S	H	N	H	3	0	0	0	0	2	0	2	5	2	0	0	0	0	2	0	0	5	11	7	0	3	0	6	1	11	33	5	49	8.3
61	2	3	4	C	H	N	L	0	1	4	0	0	4	3	2	0	1	4	0	0	3	1	0	0	0	2	5	0	2	0	3	6	11	18	12	41	11.1
62	2	3	4	C	H	S	H	0	2	5	0	0	2	13	10	1	4	4	0	0	1	7	0	0	0	1	7	0	4	0	3	12	27	27	22	76	9.6
63	2	3	4	S	H	S	L	1	0	0	0	0	4	0	0	4	5	0	0	1	0	7	4	0	1	9	7	0	10	0	6	0	21	33	5	59	8.9
64	2	3	4	C	L	S	H	0	3	3	0	0	1	0	6	7	5	11	0	0	7	4	0	0	2	1	4	0	3	0	3	9	40	22	7	69	10.9
65	2	3	5	S	L	N	L	2	0	0	0	0	0	0	4	9	1	0	0	0	0	0	0	0	3	0	3	0	2	0	2	0	14	10	2	26	5.3
66	2	3	5	S	H	S	H	4	0	0	0	0	5	0	5	12	10	0	0	1	0	11	0	0	1	9	10	0	11	0	8	1	39	40	9	88	9.7
67	2	3	5	S	L	N	H	1	0	0	0	0	0	0	3	12	2	0	0	0	0	0	0	0	2	1	3	0	4	0	7	0	17	17	1	35	5.2
68	2	3	5	C	H	S	H	3	2	9	0	0	2	16	8	4	4	12	0	0	10	12	2	0	4	6	9	0	4	0	1	12	52	36	32	120	12.7
69	2	3	5	S	H	S	L	3	0	0	0	0	1	0	2	8	4	0	0	0	0	11	0	0	0	0	11	0	2	0	3	0	25	16	4	45	5.8
70	2	3	5	S	H	N	H	3	0	2	0	0	2	0	5	13	3	0	0	0	0	4	0	0	1	1	11	0	2	0	3	1	25	19	7	51	7.0
71	2	3	5	C	H	N	L	0	5	0	0	0	1	0	4	6	0	1	0	0	7	0	10	0	3	0	3	0	3	0	2	2	28	13	6	47	8.4

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
72	2	3	5	S	L	S	H	0	0	0	0	0	0	0	7	12	6	0	0	0	0	6	0	0	1	2	9	0	4	0	4	0	31	20	0	51	6.8
73	2	3	5	C	L	N	H	0	0	5	0	0	1	0	1	5	1	14	0	0	11	2	0	0	6	0	2	0	6	0	6	5	34	25	6	65	8.3
74	2	3	5	C	H	S	L	1	3	2	0	0	0	6	4	5	0	2	0	0	1	7	0	0	2	0	8	0	3	0	5	2	19	20	12	51	10.4
75	2	3	5	C	L	S	L	0	0	3	0	0	0	1	5	6	1	7	0	0	9	3	0	0	0	0	4	0	5	0	0	2	31	11	4	46	8.3
76	2	3	5	S	H	N	L	3	0	0	0	0	5	0	3	7	2	0	0	0	0	0	0	0	0	3	7	0	8	0	3	0	12	21	8	41	7.4
77	2	3	5	C	H	N	H	0	9	3	0	0	5	0	2	5	3	6	0	0	7	2	0	0	1	1	1	0	2	0	1	7	25	13	17	55	10.1
78	2	3	5	S	L	S	L	0	0	0	0	0	0	0	6	4	3	1	0	0	0	4	0	0	2	3	3	0	2	0	5	1	18	16	0	34	8.9
79	2	3	5	C	L	S	H	0	5	2	0	0	0	0	2	3	8	3	0	0	5	5	1	0	4	2	4	0	3	0	6	6	27	25	7	59	12.3
80	2	3	5	C	L	N	L	1	1	0	0	0	2	0	1	4	0	4	0	0	13	0	0	0	0	0	2	0	2	0	3	3	22	10	4	36	5.5
1	2	4	1	C	H	S	H	4	1	2	0	0	0	0	1	2	3	11	6	0	10	6	0	0	0	0	5	0	1	0	6	8	39	20	7	66	9.6
2	2	4	1	C	H	N	H	5	2	3	0	0	2	0	9	9	2	18	6	0	12	0	5	0	3	0	3	0	4	0	5	6	61	21	12	94	10.6
3	2	4	1	S	L	S	L	1	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	1	0	1	0	0	0	1	0	4	3	1	8	5.3
4	2	4	1	S	L	N	L	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	2	5	2.8
5	2	4	1	S	H	S	L	11	0	0	0	0	4	0	3	4	7	0	2	2	0	1	3	0	4	1	7	0	4	0	5	0	22	21	15	58	10.0
6	2	4	1	S	H	S	H	1	0	0	0	0	1	0	6	7	4	0	1	0	4	3	0	0	2	4	3	0	4	0	4	0	25	17	2	44	10.2
7	2	4	1	C	H	S	L	0	6	5	0	0	2	0	6	4	2	6	1	1	0	2	1	0	0	0	7	0	2	0	1	6	23	16	13	52	10.6
8	2	4	1	C	L	S	H	0	1	2	0	0	0	0	3	7	0	13	0	0	15	1	0	0	0	0	4	0	3	0	1	1	39	9	3	51	5.4
9	2	4	1	C	L	S	H	0	0	5	0	0	0	0	5	4	0	4	0	2	3	0	0	0	0	0	1	0	1	0	0	0	18	2	5	25	6.4
10	2	4	1	C	L	N	H	0	0	0	0	0	0	0	1	2	0	0	0	0	5	0	0	0	0	1	0	0	0	0	0	0	8	1	0	9	2.6
11	2	4	1	S	H	N	L	10	0	4	0	0	3	0	6	7	4	0	5	0	0	0	2	0	0	3	9	0	3	0	2	0	24	17	17	58	9.4
12	2	4	1	C	L	N	L	2	0	0	0	0	0	0	2	5	1	3	3	0	15	0	1	0	0	0	1	0	0	0	1	2	30	4	2	36	4.6
13	2	4	1	C	H	N	L	0	2	2	0	0	3	0	3	4	1	5	2	3	9	1	5	0	3	1	4	0	4	0	3	4	33	19	7	59	13.7
14	2	4	1	S	H	N	H	7	0	0	0	0	1	0	4	1	4	2	2	2	1	1	9	0	0	3	6	0	5	0	7	2	26	23	8	57	10.8
15	2	4	1	S	L	S	H	0	0	0	0	0	1	0	10	8	3	0	2	0	0	1	0	0	0	0	4	0	1	0	1	0	24	6	1	31	4.9
16	2	4	1	S	L	N	H	3	0	0	0	0	3	0	2	8	2	0	4	0	0	0	0	0	2	0	7	0	1	0	1	1	16	12	6	34	7.1
17	2	4	2	S	L	S	H	2	1	0	0	0	0	0	4	11	3	0	8	2	0	3	1	0	3	0	3	0	9	0	7	0	32	22	3	57	8.6
18	2	4	2	C	H	N	L	0	4	3	0	0	2	0	1	3	2	5	4	0	10	0	0	0	0	2	3	0	8	0	9	6	25	28	9	62	10.2
19	2	4	2	S	H	S	H	0	0	0	0	0	3	0	3	4	3	1	1	0	0	7	1	0	0	3	5	0	8	0	9	0	20	25	3	48	8.4
20	2	4	2	C	L	N	H	0	0	2	0	0	0	0	3	2	0	6	2	0	9	0	0	0	0	0	1	0	0	0	6	1	22	8	2	32	5.8
21	2	4	2	S	H	N	H	0	0	0	0	0	6	0	7	8	3	0	8	2	1	0	0	0	3	0	4	0	9	0	13	0	29	29	6	64	8.2
22	2	4	2	S	L	N	H	6	0	0	0	0	0	0	3	9	4	0	7	0	0	0	0	0	6	0	4	0	4	0	9	0	23	23	6	52	8.0
23	2	4	2	S	H	S	L	0	0	0	0	0	6	0	1	7	3	1	8	0	0	6	0	0	3	5	5	0	11	0	9	0	26	33	6	65	9.2
24	2	4	2	C	H	N	H	2	5	2	0	0	4	0	0	4	2	4	4	0	6	0	0	0	3	1	3	0	10	0	3	9	20	29	13	62	11.1
25	2	4	2	C	L	S	H	2	0	0	0	0	0	0	8	8	1	10	1	0	8	4	1	0	0	0	0	0	4	0	2	6	41	12	2	55	8.2
26	2	4	2	C	L	S	L	2	1	5	0	0	0	0	1	3	3	11	0	0	9	4	0	0	2	0	5	0	1	0	2	4	31	14	8	53	8.9

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
27	2	4	2	S	H	N	L	1	0	0	0	0	4	0	6	8	3	1	8	0	0	0	0	0	5	7	5	0	5	0	5	0	26	27	5	58	9.9
28	2	4	2	C	H	S	L	0	3	6	0	0	2	11	5	4	4	10	7	0	2	4	0	0	1	2	4	0	7	0	1	9	36	24	22	82	12.3
29	2	4	2	C	H	S	H	0	5	5	0	0	4	13	5	5	5	15	10	0	3	7	1	0	1	0	3	0	4	0	7	10	51	25	27	103	12.2
30	2	4	2	S	L	S	L	1	0	0	0	0	3	0	2	4	5	1	1	0	0	1	3	0	1	2	2	0	7	0	5	0	17	17	4	38	9.6
31	2	4	2	C	L	N	L	2	1	0	0	0	0	0	1	3	0	8	1	0	10	0	0	0	1	0	3	0	0	0	1	0	23	5	3	31	5.0
32	2	4	2	S	L	N	L	4	0	0	0	0	0	0	0	12	0	0	3	0	0	0	0	0	0	0	1	0	3	0	0	0	15	4	4	23	3.0
33	2	4	3	C	L	S	L	1	1	1	0	0	0	0	5	8	4	13	0	0	11	2	0	0	0	0	2	0	0	0	3	7	43	12	3	58	7.3
34	2	4	3	S	L	N	L	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	5	0	0	0	2	0	0	0	2	2	9	6	0	15	4.8
35	2	4	3	C	L	N	L	1	0	0	0	0	0	0	1	2	1	4	0	0	7	0	0	0	0	1	2	0	0	0	3	2	15	8	1	24	6.4
36	2	4	3	S	L	S	L	1	0	0	0	0	0	0	2	2	0	0	0	0	0	1	0	0	0	1	2	0	0	0	3	0	5	6	1	12	6.0
37	2	4	3	S	H	S	L	1	0	0	0	0	4	0	3	6	6	0	3	0	0	6	0	0	2	1	4	0	5	0	2	0	24	14	5	43	9.6
38	2	4	3	C	H	S	L	2	2	5	0	0	1	0	4	3	2	5	4	0	1	7	1	0	0	1	6	0	1	0	4	11	27	23	10	60	10.9
39	2	4	3	S	H	N	L	1	0	4	0	0	0	0	2	17	1	0	3	0	0	2	2	0	2	2	7	0	3	0	2	0	27	16	5	48	5.8
40	2	4	3	S	L	N	H	2	0	0	0	0	0	0	3	5	0	0	0	0	0	0	1	0	2	0	4	0	2	0	2	0	9	10	2	21	6.6
41	2	4	3	S	H	N	H	0	0	1	0	0	3	0	2	6	0	0	3	0	2	2	0	0	4	1	7	0	0	0	6	1	15	19	4	38	8.5
42	2	4	3	C	H	S	H	0	3	9	0	0	7	8	1	7	1	9	2	0	1	8	0	0	3	0	2	0	2	0	5	6	29	18	27	74	11.4
43	2	4	3	S	H	S	H	2	0	1	0	0	4	0	1	3	0	0	1	1	0	6	0	0	1	1	4	0	5	0	4	2	12	17	7	36	9.8
44	2	4	3	C	L	N	H	0	1	2	0	0	3	0	1	5	0	8	2	0	12	0	0	0	0	0	5	0	2	0	3	5	28	15	6	49	7.6
45	2	4	3	C	H	N	H	1	1	8	0	0	5	0	5	3	0	9	0	0	2	4	0	0	3	4	7	0	2	0	0	6	23	22	15	60	10.6
46	2	4	3	S	L	S	H	2	0	0	0	0	0	0	4	8	2	0	1	0	0	6	0	0	3	2	1	0	6	0	6	0	21	18	2	41	8.0
47	2	4	3	C	H	N	L	0	4	3	0	0	1	0	2	2	1	3	2	0	6	0	0	0	0	1	0	0	6	0	0	6	16	13	8	37	8.7
48	2	4	3	C	L	S	H	0	0	6	0	0	0	0	6	7	1	9	1	0	9	2	0	0	1	0	3	0	3	0	4	2	35	13	6	54	8.9
49	2	4	4	S	L	S	L	2	0	0	0	0	2	0	3	6	4	0	2	0	0	0	0	0	0	2	6	0	1	0	6	0	15	15	4	34	7.7
50	2	4	4	S	H	N	L	4	0	0	0	0	2	0	0	6	3	0	0	0	0	0	0	0	1	3	5	0	10	0	4	0	9	23	6	38	6.7
51	2	4	4	S	L	N	L	3	0	0	0	0	2	0	0	5	0	0	5	0	0	0	0	0	0	1	6	0	1	0	0	0	10	8	5	23	5.2
52	2	4	4	C	H	S	L	2	3	4	0	0	1	0	4	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	8	2	10	20	6.3
53	2	4	4	C	L	N	H	0	0	0	0	0	1	0	2	6	1	7	2	0	8	1	0	0	0	0	3	0	1	0	1	5	27	10	1	38	7.4
54	2	4	4	S	H	S	H	0	0	0	0	0	1	0	4	5	3	0	4	0	0	6	0	0	6	5	4	0	7	0	8	0	22	30	1	53	9.6
55	2	4	4	C	H	N	H	2	2	3	0	0	5	0	3	4	8	12	6	0	7	3	0	0	2	3	5	0	0	0	3	4	43	17	12	72	12.0
56	2	4	4	C	L	N	L	1	0	0	0	0	2	0	0	2	0	9	2	0	6	4	0	0	0	1	2	0	0	0	7	4	23	14	3	40	7.4
57	2	4	4	S	L	N	H	5	0	0	0	0	0	0	3	8	2	0	2	0	0	0	0	0	2	0	0	0	2	0	3	0	15	7	5	27	5.9
58	2	4	4	S	L	S	H	1	0	0	0	0	0	0	5	5	5	0	5	0	0	4	0	0	3	0	2	0	4	0	6	0	24	15	1	40	8.8
59	2	4	4	C	L	S	L	1	2	3	0	0	0	1	4	5	2	11	2	0	2	5	0	0	2	0	4	0	5	0	5	0	31	16	7	54	10.3
60	2	4	4	S	H	N	H	3	0	0	0	0	0	0	1	4	1	0	6	0	0	2	0	0	5	3	3	0	8	0	7	0	14	26	3	43	8.3
61	2	4	4	C	H	N	L	1	0	5	0	0	4	2	2	0	1	4	6	0	4	2	0	0	0	1	4	0	2	0	1	2	19	10	12	41	11.3

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
62	2	4	4	C	H	S	H	1	1	6	0	0	3	11	8	2	5	8	6	0	1	7	0	0	0	2	4	0	8	0	2	4	37	20	22	79	12.1
63	2	4	4	S	H	S	L	0	0	1	0	0	1	0	1	2	4	0	5	1	0	8	1	0	2	3	9	0	8	0	8	0	22	30	2	54	8.7
64	2	4	4	C	L	S	H	0	1	2	0	0	0	0	2	5	6	13	3	0	9	3	0	0	3	0	1	0	2	0	1	4	41	11	3	55	8.2
65	2	4	5	S	L	N	L	0	0	0	0	0	0	0	3	6	1	0	2	0	0	0	0	0	4	0	2	0	2	0	1	0	12	9	0	21	5.9
66	2	4	5	S	H	S	H	2	0	2	0	0	0	0	4	5	12	1	5	0	0	11	0	0	2	2	4	0	9	0	7	2	38	26	4	68	9.3
67	2	4	5	S	L	N	H	0	0	0	0	0	0	0	2	9	3	0	5	0	0	0	0	0	1	1	5	0	3	0	7	1	19	18	0	37	6.7
68	2	4	5	C	H	S	H	0	0	10	0	0	3	8	5	5	2	12	2	0	10	11	0	0	1	1	2	0	0	0	2	9	47	15	21	83	10.0
69	2	4	5	S	H	S	L	5	0	2	0	0	0	0	3	8	5	0	7	0	0	9	0	0	1	0	8	0	2	0	2	0	32	13	7	52	8.2
70	2	4	5	S	H	N	H	1	0	3	0	0	1	0	2	1	7	0	9	0	0	6	0	0	0	0	5	0	1	0	3	0	25	9	5	39	7.0
71	2	4	5	C	H	N	L	0	5	0	0	0	1	0	2	4	0	3	2	1	4	0	7	0	0	0	0	0	5	0	2	1	23	8	6	37	8.8
72	2	4	5	S	L	S	H	0	0	0	0	0	0	0	2	6	8	0	8	0	0	9	0	0	0	1	3	0	4	0	5	0	33	13	0	46	7.1
73	2	4	5	C	L	N	H	0	0	0	0	0	1	0	1	2	1	11	0	0	9	1	0	0	4	0	3	0	3	0	6	2	25	18	1	44	6.8
74	2	4	5	C	H	S	L	0	2	10	0	0	3	7	3	4	1	2	1	0	1	4	0	0	0	0	6	0	3	0	4	3	16	16	22	54	10.4
75	2	4	5	C	L	S	L	0	0	2	0	0	0	0	2	4	1	7	1	0	6	3	0	0	0	0	2	0	2	0	3	2	24	9	2	35	8.7
76	2	4	5	S	H	N	L	0	0	0	0	0	2	0	5	3	1	0	8	0	0	0	0	0	0	0	2	0	8	0	2	0	17	12	2	31	5.5
77	2	4	5	C	H	N	H	0	3	6	0	0	4	0	2	2	4	8	3	0	2	2	0	0	0	0	1	0	2	0	0	5	23	8	13	44	9.9
78	2	4	5	S	L	S	L	0	0	0	0	0	0	0	3	3	4	1	12	0	0	5	0	0	1	3	3	0	2	0	5	1	28	15	0	43	7.3
79	2	4	5	C	L	S	H	0	2	5	0	0	0	1	0	4	7	6	0	0	6	4	0	0	1	1	4	0	2	0	4	4	27	16	8	51	11.0
80	2	4	5	C	L	N	L	1	1	0	0	0	1	0	0	3	0	4	0	0	9	0	0	0	0	0	2	0	4	0	2	2	16	10	3	29	6.1
1	2	5	1	C	H	S	H	5	2	0	0	0	0	0	1	6	2	12	5	0	10	7	0	0	0	0	8	0	2	0	5	3	43	18	7	68	9.4
2	2	5	1	C	H	N	H	4	1	6	0	0	2	0	2	9	3	7	3	0	10	0	3	0	0	0	4	0	2	0	5	9	37	20	13	70	11.0
3	2	5	1	S	L	S	L	1	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	3	2	1	6	4.5
4	2	5	1	S	L	N	L	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4	2.0
5	2	5	1	S	H	S	L	7	0	1	0	0	2	0	2	3	4	0	3	2	0	2	3	0	2	0	0	0	5	0	7	0	19	14	10	43	9.9
6	2	5	1	S	H	S	H	1	0	0	0	0	1	0	2	2	3	0	2	0	1	2	0	0	1	2	4	0	5	0	2	0	12	14	2	28	10.1
7	2	5	1	C	H	S	L	0	4	5	0	0	1	2	4	3	2	6	2	0	0	4	1	0	0	0	6	0	2	0	2	3	22	13	12	47	11.9
8	2	5	1	C	L	S	H	0	0	2	0	0	0	0	2	5	0	13	1	0	11	1	0	0	0	0	0	0	2	0	3	1	33	6	2	41	5.0
9	2	5	1	C	L	S	H	0	0	2	0	0	0	0	3	3	0	2	0	1	2	0	0	0	0	0	1	0	1	0	1	0	11	3	2	16	7.5
10	2	5	1	C	L	N	H	0	0	0	0	0	0	0	1	1	0	3	0	0	3	0	0	0	0	0	0	0	1	0	0	0	8	1	0	9	3.9
11	2	5	1	S	H	N	L	5	0	2	0	0	3	0	1	8	4	0	5	0	0	0	0	0	0	3	4	0	3	0	10	0	18	20	10	48	8.3
12	2	5	1	C	L	N	L	1	0	0	0	0	0	0	1	4	2	4	3	0	15	0	1	0	0	0	1	0	0	0	1	3	30	5	1	36	4.6
13	2	5	1	C	H	N	L	1	3	4	0	0	2	0	2	3	1	6	1	0	8	0	3	0	1	1	1	0	5	0	5	2	24	15	10	49	11.4
14	2	5	1	S	H	N	H	4	0	0	0	0	3	0	5	4	3	0	3	0	0	4	10	0	1	1	6	0	5	0	12	1	29	26	7	62	9.4
15	2	5	1	S	L	S	H	0	0	0	0	0	1	0	4	5	3	0	2	0	0	1	0	0	0	0	4	0	2	0	1	0	15	7	1	23	6.9
16	2	5	1	S	L	N	H	2	0	0	0	0	3	0	2	6	2	0	3	0	0	0	0	0	2	0	1	0	1	0	1	1	13	6	5	24	7.8

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
17	2	5	2	S	L	S	H	2	0	0	0	0	0	0	2	11	3	0	8	1	0	3	0	0	1	0	2	0	8	0	7	1	28	19	2	49	7.3
18	2	5	2	C	H	N	L	0	2	3	0	0	2	0	0	2	2	7	4	0	11	0	0	0	0	1	8	0	7	0	4	3	26	23	7	56	9.0
19	2	5	2	S	H	S	H	0	0	0	0	0	5	0	2	5	4	0	4	0	0	7	1	0	0	4	6	0	5	0	6	0	23	21	5	49	9.6
20	2	5	2	C	L	N	H	0	1	2	0	0	0	0	2	3	0	5	0	0	10	0	0	0	0	0	1	0	0	0	5	2	20	8	3	31	5.6
21	2	5	2	S	H	N	H	1	0	0	0	0	3	0	1	10	3	2	7	1	0	0	0	0	3	3	6	0	5	0	12	1	24	30	4	58	8.5
22	2	5	2	S	L	N	H	2	0	0	0	0	0	0	1	7	4	0	5	0	0	0	0	0	4	0	4	0	3	0	10	1	17	22	2	41	7.1
23	2	5	2	S	H	S	L	0	0	0	0	0	5	0	0	7	1	0	10	0	0	8	0	0	2	0	3	0	8	0	12	1	26	26	5	57	7.0
24	2	5	2	C	H	N	H	2	6	1	0	0	4	0	0	9	2	6	4	0	8	1	0	0	3	0	1	0	11	0	2	5	30	22	13	65	10.1
25	2	5	2	C	L	S	H	2	0	0	0	0	0	0	5	2	2	7	1	0	6	3	2	0	0	1	1	0	3	0	2	2	28	9	2	39	9.8
26	2	5	2	C	L	S	L	1	2	4	0	0	0	0	1	2	4	7	2	0	7	3	0	0	3	0	4	0	0	0	1	6	26	14	7	47	10.3
27	2	5	2	S	H	N	L	1	0	0	0	0	2	0	3	8	4	1	8	0	0	0	0	0	3	1	5	0	7	0	9	0	24	25	3	52	8.3
28	2	5	2	C	H	S	L	0	0	7	0	0	3	8	2	3	3	5	4	0	0	4	0	0	0	2	3	0	7	0	6	4	21	22	18	61	11.8
29	2	5	2	C	H	S	H	0	7	6	0	0	1	12	1	1	4	13	10	0	3	7	0	0	1	3	3	0	8	0	7	6	39	28	26	93	11.6
30	2	5	2	S	L	S	L	2	0	0	0	0	3	0	1	8	5	0	1	0	0	3	0	0	1	2	1	0	5	0	9	0	18	18	5	41	7.5
31	2	5	2	C	L	N	L	2	1	0	0	0	0	0	0	3	0	9	2	0	7	0	0	0	1	0	2	0	0	0	2	0	21	5	3	29	5.4
32	2	5	2	S	L	N	L	4	0	2	0	0	0	0	0	7	0	0	6	0	0	0	0	0	0	0	2	0	2	0	1	0	13	5	6	24	5.1
33	2	5	3	C	L	S	L	1	1	0	0	0	0	0	2	4	4	11	0	0	7	1	0	0	0	0	1	0	1	0	6	2	29	10	2	41	6.7
34	2	5	3	S	L	N	L	0	0	0	0	0	0	0	0	3	0	0	1	0	0	0	5	0	0	0	2	0	1	0	2	1	9	6	0	15	5.0
35	2	5	3	C	L	N	L	1	0	0	0	0	0	0	1	1	2	4	0	0	5	1	0	0	0	0	1	0	1	0	3	3	14	8	1	23	7.7
36	2	5	3	S	L	S	L	1	0	0	0	0	0	0	1	2	0	0	1	0	0	1	0	0	0	0	1	0	1	0	3	0	5	5	1	11	6.4
37	2	5	3	S	H	S	L	0	0	1	0	0	4	0	2	6	3	0	2	0	0	8	0	0	2	2	1	0	3	0	4	0	21	12	5	38	8.6
38	2	5	3	C	H	S	L	1	2	4	0	0	2	0	4	2	1	7	5	0	2	1	0	0	1	1	7	0	1	0	5	5	22	20	9	51	11.5
39	2	5	3	S	H	N	L	1	0	3	0	0	0	0	3	8	0	0	2	0	0	2	1	0	1	2	3	0	2	0	5	0	16	13	4	33	8.1
40	2	5	3	S	L	N	H	2	0	0	0	0	0	0	2	5	0	0	5	0	0	0	1	0	3	0	4	0	2	0	3	0	13	12	2	27	7.5
41	2	5	3	S	H	N	H	0	0	2	0	0	3	0	3	4	0	2	3	0	2	1	0	0	1	1	3	0	2	0	6	0	15	13	5	33	10.2
42	2	5	3	C	H	S	H	0	2	8	0	0	5	8	0	7	1	7	5	0	1	6	0	0	1	0	1	0	3	0	0	1	27	6	23	56	9.5
43	2	5	3	S	H	S	H	1	0	2	0	0	4	0	2	4	0	0	1	0	0	5	0	0	1	0	2	0	6	0	6	0	12	15	7	34	8.0
44	2	5	3	C	L	N	H	0	1	1	0	0	3	0	0	2	0	10	5	0	9	0	0	0	0	0	3	0	4	0	3	5	26	15	5	46	7.6
45	2	5	3	C	H	N	H	0	2	5	0	0	4	0	3	2	1	5	0	0	2	2	0	0	2	1	2	0	4	0	1	5	15	15	11	41	11.8
46	2	5	3	S	L	S	H	1	0	0	0	0	0	0	1	6	3	0	1	0	0	8	0	0	1	1	1	0	6	0	5	1	19	15	1	35	6.9
47	2	5	3	C	H	N	L	0	5	0	0	0	3	0	0	4	0	5	2	0	5	0	0	0	0	1	1	0	5	0	0	4	16	11	8	35	8.3
48	2	5	3	C	L	S	H	0	0	4	0	0	0	0	3	7	1	6	2	0	6	1	0	0	1	0	2	0	4	0	2	1	26	10	4	40	9.0
49	2	5	4	S	L	S	L	2	0	1	0	0	2	0	2	6	4	0	3	0	1	1	0	0	0	2	4	0		0	2	0	17	8	5	30	9.0
50	2	5	4	S	H	N	L	3	0	0	0	0	2	0	0	9	3	1	1	0	1	0	0	0	2	2	7	0	9	0	6	0	15	26	5	46	7.6
51	2	5	4	S	L	N	L	3	0	0	0	0	2	0	0	5	0	0	3	0	2	0	0	0	0	1	4	0	3	0	7	0	10	15	5	30	7.1

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
52	2	5	4	C	H	S	L	2	3	7	0	0	2	0	3	4	0	2	0	0	1	0	0	0	0	0	0	0	0	0	2	0	10	2	14	26	6.8
53	2	5	4	C	L	N	H	0	0	0	0	0	1	0	1	3	1	7	2	0	8	0	0	0	0	0	4	0	1	0	4	4	22	13	1	36	7.3
54	2	5	4	S	H	S	H	0	0	0	0	0	0	0	2	8	3	1	4	0	0	6	0	0	4	2	6	0	10	0	14	0	24	36	0	60	7.5
55	2	5	4	C	H	N	H	2	7	1	0	0	8	0	0	3	6	12	8	0	8	2	0	0	2	0	6	0	4	0	10	6	39	28	18	85	11.5
56	2	5	4	C	L	N	L	1	2	0	0	0	3	0	0	3	1	6	1	0	8	0	0	0	2	0	0	0	2	0	6	2	19	12	6	37	7.9
57	2	5	4	S	L	N	H	5	0	3	0	0	0	0	1	7	1	0	3	0	0	0	0	0	2	0	0	0	1	0	2	0	12	5	8	25	6.1
58	2	5	4	S	L	S	H	0	0	0	0	0	0	0	3	5	4	0	9	0	0	4	0	0	3	0	2	0	6	0	12	0	25	23	0	48	6.8
59	2	5	4	C	L	S	L	1	2	4	0	0	0	1	3	4	1	9	3	0	4	1	0	0	0	0	3	0	5	0	5	4	25	17	8	50	10.9
60	2	5	4	S	H	N	H	3	0	0	0	0	1	0	1	6	1	0	8	0	0	1	0	0	4	4	4	0	8	0	9	0	17	29	4	50	8.2
61	2	5	4	C	H	N	L	0	1	6	0	0	3	2	0	0	0	6	7	0	1	1	0	0	0	2	3	0	4	0	3	4	15	16	12	43	9.7
62	2	5	4	C	H	S	H	0	2	3	0	0	2	10	1	2	4	9	4	0	2	3	0	0	0	1	1	0	5	0	4	5	25	16	17	58	10.6
63	2	5	4	S	H	S	L	0	0	2	0	0	4	0	2	3	3	0	3	0	0	6	1	0	1	3	6	0	9	0	8	1	18	28	6	52	9.7
64	2	5	4	C	L	S	H	0	1	1	0	0	0	0	0	8	8	11	4	0	7	0	0	0	1	2	0	0	3	0	1	6	38	13	2	53	7.7
65	2	5	5	S	L	N	L	2	0	0	0	0	0	0	1	6	1	0	3	0	0	0	0	0	2	0	4	0	3	0	1	0	11	10	2	23	6.5
66	2	5	5	S	H	S	H	4	0	3	0	0	3	0	2	9	8	0	7	0	3	11	0	0	1	4	5	0	12	0	10	0	40	32	10	82	10.4
67	2	5	5	S	L	N	H	0	0	0	0	0	0	0	1	9	2	0	6	0	0	1	0	0	2	1	2	0	4	0	6	0	19	15	0	34	6.3
68	2	5	5	C	H	S	H	2	1	6	0	0	3	10	1	0	3	10	6	0	6	5	0	0	2	0	3	0	3	0	3	5	31	16	22	69	11.5
69	2	5	5	S	H	S	L	3	0	0	0	0	1	0	4	6	2	0	7	0	0	9	0	0	2	0	0	0	4	0	9	0	28	15	4	47	7.4
70	2	5	5	S	H	N	H	3	0	0	0	0	3	0	3	4	6	0	11	0	0	3	0	0	1	1	4	0	1	0	7	0	27	14	6	47	8.0
71	2	5	5	C	H	N	L	0	7	0	0	0	2	0	0	1	0	2	1	0	4	0	6	0	2	0	2	0	2	0	1	1	14	8	9	31	7.7
72	2	5	5	S	L	S	H	1	0	0	0	0	0	0	3	7	7	1	8	0	0	4	0	0	1	1	4	0	4	0	8	0	30	18	1	49	8.4
73	2	5	5	C	L	N	H	0	0	2	0	0	1	0	1	6	1	9	0	0	6	1	0	0	2	0	1	0	2	0	4	5	24	14	3	41	8.0
74	2	5	5	C	H	S	L	0	2	10	0	0	1	5	1	5	0	4	1	0	1	5	0	0	0	0	3	0	1	0	5	2	17	11	18	46	8.9
75	2	5	5	C	L	S	L	0	1	2	0	0	0	0	3	4	1	7	1	0	6	3	0	0	0	0	3	0	3	0	3	3	25	12	3	40	9.9
76	2	5	5	S	H	N	L	2	0	1	0	0	4	0	5	3	2	0	9	0	0	0	0	0	0	1	4	0	7	0	5	0	19	17	7	43	8.0
77	2	5	5	C	H	N	H	0	5	6	0	0	5	0	1	4	4	6	3	0	4	1	0	0	0	2	1	0	2	0	3	5	23	13	16	52	12.1
78	2	5	5	S	L	S	L	0	0	0	0	0	1	0	3	4	3	1	10	0	0	3	0	0	0	2	2	0	2	0	9	1	24	16	1	41	7.0
79	2	5	5	C	L	S	H	1	2	3	0	0	1	2	2	6	4	6	3	0	6	2	0	0	1	0	2	0	3	0	5	4	29	15	9	53	13.1
80	2	5	5	C	L	N	L	1	1	0	0	0	1	0	1	4	0	6	2	0	8	0	0	0	0	0	3	0	1	0	3	3	21	10	3	34	7.6
1	3	1	1	C	H	S	H	5	1	2	0	0	0	0	0	1	1	7	0	0	4	5	0	0	0	1	10	0	1	0	7	2	18	21	8	47	8.0
2	3	1	1	C	H	N	H	5	0	6	0	0	2	0	1	3	3	10	0	0	21	0	0	0	0	2	13	0	0	0	6	2	38	23	13	74	6.5
3	3	1	1	S	L	S	L	1	0	1	0	0	0	0	0	2	0	0	0	0	1	0	0	1	0	0	2	0	0	0	1	0	4	3	2	9	6.2
4	3	1	1	S	L	N	L	11	0	4	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	15	18	2.3
5	3	1	1	S	H	S	L	6	0	3	0	0	3	0	0	2	2	0	0	0	1	2	0	0	0	1	4	0	3	0	7	0	7	15	12	34	8.1
6	3	1	1	S	H	S	H	4	0	0	0	0	1	0	2	3	5	2	0	0	4	6	0	0	0	1	3	0	7	0	6	0	22	17	5	44	9.4

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
7	3	1	1	C	H	S	L	0	5	1	0	0	3	3	0	2	3	3	0	0	0	4	0	0	0	3	7	0	1	0	4	3	12	18	12	42	10.6
8	3	1	1	C	L	S	H	0	0	0	0	0	0	0	0	2	0	10	0	0	17	2	0	0	0	1	4	0	1	0	2	0	31	8	0	39	3.6
9	3	1	1	C	L	S	H	4	0	0	0	0	0	0	0	0	0	3	0	5	1	0	0	1	0	0	0	0	1	0	1	0	10	2	4	16	4.7
10	3	1	1	C	L	N	H	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	1	0	0	0	0	0	0	3	1	0	4	2.7
11	3	1	1	S	H	N	L	11	0	5	0	0	3	0	0	4	4	0	0	0	0	0	0	0	0	1	6	0	6	0	5	1	8	19	19	46	7.4
12	3	1	1	C	L	N	L	2	0	0	0	0	0	0	1	0	1	2	0	0	8	0	0	0	0	0	1	0	0	0	1	2	12	4	2	18	4.1
13	3	1	1	C	H	N	L	2	3	2	0	0	4	0	0	3	1	5	0	0	6	2	1	0	1	2	0	0	3	0	4	2	18	12	11	41	11.8
14	3	1	1	S	H	N	H	4	0	3	0	0	2	0	0	1	2	0	0	0	1	5	6	0	0	4	2	0	4	0	13	0	15	23	9	47	7.3
15	3	1	1	S	L	S	H	0	0	0	0	0	1	0	2	0	2	1	0	0	2	0	0	0	0	1	2	0	0	0	2	0	7	5	1	13	7.3
16	3	1	1	S	L	N	H	5	0	2	0	0	4	0	0	5	2	1	0	0	0	0	0	0	0	0	5	0	1	0	0	1	8	7	11	26	6.6
17	3	1	2	S	L	S	H	2	0	1	0	0	0	0	1	5	1	2	0	0	1	2	0	0	0	4	1	0	5	0	13	1	12	24	3	39	6.0
18	3	1	2	C	H	N	L	0	0	0	0	0	1	0	0	0	3	1	0	0	17	0	0	0	0	8	0	0	5	0	8	1	21	22	1	44	4.3
19	3	1	2	S	H	S	H	0	0	0	0	0	4	0	0	6	4	2	0	0	3	9	1	0	0	7	2	0	6	0	5	0	25	20	4	49	8.7
20	3	1	2	C	L	N	H	0	0	2	0	0	0	0	0	3	0	4	0	0	2	0	0	0	0	1	1	0	0	0	8	1	9	11	2	22	4.8
21	3	1	2	S	H	N	H	1	0	0	0	0	6	0	0	7	1	0	0	0	0	1	0	0	0	4	0	0	6	0	9	0	9	19	7	35	5.5
22	3	1	2	S	L	N	H	3	0	6	0	0	0	0	0	4	3	0	0	0	0	0	0	0	0	1	3	0	4	0	9	1	7	18	9	34	6.5
23	3	1	2	S	H	S	L	2	0	0	0	0	5	0	0	3	4	0	0	0	0	6	0	0	0	5	0	0	8	0	13	2	13	28	7	48	6.5
24	3	1	2	C	H	N	H	1	0	0	0	0	4	0	0	5	2	1	0	0	11	3	0	0	0	6	2	0	8	0	5	1	22	22	5	49	7.8
25	3	1	2	C	L	S	H	2	0	2	0	0	0	0	0	1	1	4	0	0	11	3	0	0	0	1	0	0	3	0	6	0	20	10	4	34	5.7
26	3	1	2	C	L	S	L	3	1	4	0	0	0	0	0	5	4	5	0	0	8	3	0	0	0	1	8	0	0	0	2	2	25	13	8	46	8.9
27	3	1	2	S	H	N	L	1	0	5	0	0	2	0	1	5	5	0	0	0	0	1	1	0	0	6	0	0	6	0	8	0	13	20	8	41	7.7
28	3	1	2	C	H	S	L	0	0	0	0	0	2	7	0	5	4	5	0	0	4	5	0	0	0	6	1	0	6	0	9	0	23	22	9	54	9.3
29	3	1	2	C	H	S	H	0	2	4	0	0	2	3	1	3	1	5	0	0	2	6	0	0	0	4	0	0	8	0	7	5	18	24	11	53	10.7
30	3	1	2	S	L	S	L	3	0	0	0	0	2	0	0	5	3	0	0	0	0	4	1	0	0	4	1	0	6	0	9	0	13	20	5	38	7.3
31	3	1	2	C	L	N	L	8	0	1	0	0	0	0	0	1	0	2	0	0	11	0	0	0	0	0	1	0	0	0	2	0	14	3	9	26	3.4
32	3	1	2	S	L	N	L	3	0	7	0	0	0	0	0	5	0	1	0	0	1	0	0	0	0	0	3	0	2	0	1	0	7	6	10	23	5.3
33	3	1	3	C	L	S	L	2	0	0	0	0	0	0	1	6	5	12	0	0	13	3	5	0	0	0	4	0	1	0	6	3	45	14	2	61	7.8
34	3	1	3	S	L	N	L	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	2	0	1	0	2	1	5	6	0	11	4.5
35	3	1	3	C	L	N	L	2	0	0	0	0	0	0	2	0	1	7	0	0	8	0	0	0	0	1	1	0	0	0	3	2	18	7	2	27	5.3
36	3	1	3	S	L	S	L	3	0	0	0	0	0	0	0	7	0	0	0	0	0	2	0	0	0	1	1	0	1	0	4	0	9	7	3	19	4.5
37	3	1	3	S	H	S	L	1	0	1	0	0	6	0	2	5	6	0	0	0	0	5	0	0	0	4	2	0	4	0	5	0	18	15	8	41	8.9
38	3	1	3	C	H	S	L	1	2	4	0	0	3	0	3	5	2	3	0	0	7	6	0	0	0	2	7	0	4	0	10	7	26	30	10	66	11.5
39	3	1	3	S	H	N	L	4	0	6	0	0	0	0	0	13	1	0	0	0	2	4	0	0	0	4	6	0	2	0	7	0	20	19	10	49	6.9
40	3	1	3	S	L	N	H	1	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	2	5	0	2	0	3	1	6	13	1	20	6.3
41	3	1	3	S	H	N	H	0	0	0	0	0	4	0	5	6	0	5	0	0	9	6	0	0	0	3	5	0	1	0	10	2	31	21	4	56	8.8

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
42	3	1	3	C	H	S	H	0	2	2	0	0	6	11	0	7	0	3	0	0	6	7	0	0	0	2	2	0	3	0	5	10	23	22	21	66	9.7
43	3	1	3	S	H	S	H	2	0	2	0	0	4	0	1	4	0	0	0	0	0	3	0	0	0	3	1	0	7	0	8	0	8	19	8	35	7.1
44	3	1	3	C	L	N	H	2	2	2	0	0	4	0	0	4	0	3	0	0	15	0	0	0	0	1	4	0	5	0	9	3	22	22	10	54	7.1
45	3	1	3	C	H	N	H	3	0	1	0	0	5	0	2	5	1	0	0	0	6	2	0	0	0	4	7	0	4	0	7	3	16	25	9	50	10.2
46	3	1	3	S	L	S	H	3	0	2	0	0	0	0	1	11	3	0	0	0	0	4	0	0	0	3	3	0	6	0	7	0	19	19	5	43	7.0
47	3	1	3	C	H	N	L	0	1	0	0	0	4	0	1	4	3	3	0	0	7	1	0	0	0	2	1	0	7	0	2	5	19	17	5	41	9.1
48	3	1	3	C	L	S	H	0	0	0	0	0	0	0	4	8	1	3	0	0	9	1	0	0	0	1	0	0	6	0	2	2	26	11	0	37	6.3
49	3	1	4	S	L	S	L	2	0	3	0	0	2	0	1	6	5	0	0	0	1	2	0	0	0	4	8	0	2	0	4	0	15	18	7	40	8.7
50	3	1	4	S	H	N	L	0	0	5	0	0	4	0	1	6	3	0	0	0	0	0	0	0	0	7	4	0	8	0	8	0	10	27	9	46	7.6
51	3	1	4	S	L	N	L	2	0	7	0	0	2	0	0	4	0	0	0	0	1	0	0	0	0	4	5	0	2	0	5	1	5	17	11	33	7.5
52	3	1	4	C	H	S	L	3	5	7	0	0	1	0	1	10	0	0	0	0	0	1	0	0	0	0	3	0	0	0	5	0	12	8	16	36	5.9
53	3	1	4	C	L	N	H	1	0	2	0	0	1	0	0	2	1	8	0	0	10	0	0	0	0	1	5	0	2	0	4	3	21	15	4	40	7.0
54	3	1	4	S	H	S	H	1	0	2	0	0	2	0	0	5	4	0	0	0	0	6	0	0	0	6	3	0	10	0	8	0	15	27	5	47	7.5
55	3	1	4	C	H	N	H	2	2	2	0	0	6	0	1	2	4	7	0	0	9	3	0	0	0	5	4	0	0	0	11	5	26	25	12	63	10.0
56	3	1	4	C	L	N	L	2	0	3	0	0	2	0	0	0	1	5	0	0	6	0	0	0	0	3	2	0	3	0	5	4	12	17	7	36	9.1
57	3	1	4	S	L	N	H	3	0	10	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	2	0	2	0	6	0	6	10	13	29	4.7
58	3	1	4	S	L	S	H	3	0	3	0	0	0	0	2	2	3	0	0	0	4	2	1	0	0	2	4	0	4	0	10	1	14	21	6	41	8.7
59	3	1	4	C	L	S	L	2	1	2	0	0	0	0	0	0	1	7	0	0	4	1	0	0	0	2	3	0	6	0	7	4	13	22	5	40	8.4
60	3	1	4	S	H	N	H	6	0	0	0	0	2	0	1	6	2	2	0	0	0	2	0	0	0	11	0	0	4	0	12	0	13	27	8	48	6.2
61	3	1	4	C	H	N	L	0	0	3	0	0	2	4	0	0	1	6	0	0	7	1	0	0	0	4	1	0	1	0	6	2	15	14	9	38	8.3
62	3	1	4	C	H	S	H	0	3	0	0	0	2	10	5	2	5	7	0	0	4	7	0	0	0	7	2	0	4	0	11	4	30	28	15	73	10.9
63	3	1	4	S	H	S	L	1	0	0	0	0	4	0	1	3	7	0	0	1	1	8	0	0	0	10	1	0	7	0	11	0	21	29	5	55	7.3
64	3	1	4	C	L	S	H	0	1	0	0	0	3	0	0	7	6	5	0	0	9	2	0	0	0	1	6	0	3	0	6	5	29	21	4	54	9.3
65	3	1	5	S	L	N	L	4	0	0	0	0	0	0	1	4	1	0	0	0	2	0	0	0	0	0	6	0	3	0	3	0	8	12	4	24	6.3
66	3	1	5	S	H	S	H	2	0	5	0	0	2	0	3	4	7	0	0	0	0	11	0	0	0	7	5	0	9	0	8	0	25	29	9	63	8.9
67	3	1	5	S	L	N	H	0	0	2	0	0	0	0	0	9	2	0	0	0	1	0	0	0	0	2	3	0	3	0	6	1	12	15	2	29	5.6
68	3	1	5	C	H	S	H	1	0	3	0	0	3	16	8	6	2	8	0	0	4	12	0	0	0	6	11	0	0	0	8	1	40	26	23	89	9.6
69	3	1	5	S	H	S	L	0	0	10	0	0	1	0	2	4	6	0	0	0	3	9	0	0	0	1	9	0	5	0	7	0	24	22	11	57	8.1
70	3	1	5	S	H	N	H	2	0	7	0	0	2	0	0	12	4	0	0	0	0	3	0	0	0	3	11	0	3	0	5	0	19	22	11	52	6.9
71	3	1	5	C	H	N	L	0	1	0	0	0	2	0	3	5	0	2	0	0	10	0	5	0	0	2	4	0	4	0	3	3	25	16	3	44	8.7
72	3	1	5	S	L	S	H	1	0	4	0	0	0	0	3	8	6	0	0	0	0	2	0	0	0	3	4	0	5	0	11	0	19	23	5	47	7.3
73	3	1	5	C	L	N	H	1	0	0	0	0	1	0	1	0	3	7	0	0	15	1	0	0	0	1	4	0	3	0	7	1	27	16	2	45	5.6
74	3	1	5	C	H	S	L	0	1	2	0	0	0	10	0	7	1	0	0	0	3	4	1	0	0	0	4	0	6	0	1	3	16	14	13	43	7.6
75	3	1	5	C	L	S	L	0	0	0	0	0	0	0	0	2	1	2	0	0	4	1	0	0	0	0	4	0	3	0	1	1	10	9	0	19	6.8
76	3	1	5	S	H	N	L	2	0	4	0	0	2	0	2	6	2	0	0	0	5	0	0	0	0	6	1	0	4	0	0	0	15	11	8	34	7.9

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
77	3	1	5	C	H	N	H	0	2	0	0	0	5	0	0	4	4	7	0	0	5	0	0	0	0	2	1	0	2	0	4	3	20	12	7	39	9.0
78	3	1	5	S	L	S	L	1	0	0	0	0	2	0	1	6	4	1	0	0	0	6	0	0	0	5	5	0	2	0	5	1	18	18	3	39	8.7
79	3	1	5	C	L	S	H	1	2	1	0	0	2	2	0	0	5	5	0	0	10	4	0	0	0	3	5	0	3	0	4	2	24	17	8	49	9.9
80	3	1	5	C	L	N	L	1	0	1	0	0	2	0	0	3	0	4	0	0	2	0	0	0	0	0	2	0	5	0	4	3	9	14	4	27	8.2
1	3	2	1	C	H	S	H	4	1	2	0	0	0	0	1	1	2	9	0	0	10	5	0	0	0	2	10	0	1	0	6	10	28	29	7	64	8.6
2	3	2	1	C	H	N	H	6	6	7	0	0	2	0	4	0	2	9	0	1	20	0	2	0	1	2	10	0	0	0	6	4	38	23	21	82	8.5
3	3	2	1	S	L	S	L	1	0	0	1	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3	2	2	7	5.4
4	3	2	1	S	L	N	L	2	0	8	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	10	13	2.3
5	3	2	1	S	H	S	L	5	0	3	0	0	4	0	2	3	5	0	0	0	0	0	0	0	0	1	5	0	4	0	7	0	10	17	12	39	8.5
6	3	2	1	S	H	S	H	1	1	2	0	0	1	0	4	3	4	1	0	0	6	6	0	0	1	1	7	0	4	0	6	0	24	19	5	48	10.3
7	3	2	1	C	H	S	L	0	5	0	0	0	1	2	3	3	3	6	0	1	0	10	0	0	0	2	7	0	1	0	3	2	26	15	8	49	9.2
8	3	2	1	C	L	S	H	0	0	0	0	0	1	0	3	4	0	8	0	0	21	1	0	0	0	1	3	0	1	0	1	1	37	7	1	45	3.7
9	3	2	1	C	L	S	H	3	0	1	0	0	0	0	1	0	0	8	0	4	4	2	0	0	0	0	0	0	1	0	1	0	19	2	4	25	5.5
10	3	2	1	C	L	N	H	0	0	0	0	0	0	0	1	0	0	2	0	0	4	0	0	0	0	1	0	0	0	0	0	0	7	1	0	8	2.9
11	3	2	1	S	H	N	L	8	1	5	0	0	3	0	3	4	4	0	0	0	0	0	0	0	0	3	7	0	3	0	10	0	11	23	17	51	8.5
12	3	2	1	C	L	N	L	2	0	0	0	0	0	0	1	0	1	2	0	0	13	0	0	0	0	0	1	0	0	0	1	3	17	5	2	24	3.0
13	3	2	1	C	H	N	L	0	7	2	0	0	3	0	4	1	1	6	0	0	8	3	2	0	0	2	1	0	3	0	5	3	25	14	12	51	10.8
14	3	2	1	S	H	N	H	2	0	3	0	0	2	0	3	3	3	1	0	0	4	5	9	0	1	4	6	0	4	0	9	1	28	25	7	60	11.3
15	3	2	1	S	L	S	H	0	0	0	0	0	1	0	4	4	3	1	0	0	2	1	0	0	0	2	1	0	0	0	2	0	15	5	1	21	7.7
16	3	2	1	S	L	N	H	3	0	3	0	0	4	0	2	8	2	2	0	0	0	0	0	0	0	0	3	0	1	0	2	2	14	8	10	32	8.0
17	3	2	2	S	L	S	H	3	0	4	0	0	0	0	3	6	3	0	0	0	1	4	0	0	1	6	4	0	3	0	10	0	17	24	7	48	8.9
18	3	2	2	C	H	N	L	0	2	0	0	0	2	0	0	0	1	3	0	0	16	0	0	0	0	6	6	0	3	0	7	4	20	26	4	50	6.0
19	3	2	2	S	H	S	H	0	0	1	0	0	3	0	2	8	3	0	0	0	1	7	2	0	0	8	5	0	6	0	9	0	23	28	4	55	8.7
20	3	2	2	C	L	N	H	1	0	2	0	0	0	0	3	2	0	5	0	0	5	1	0	0	0	0	1	0	0	0	6	2	16	9	3	28	7.1
21	3	2	2	S	H	N	H	2	0	3	0	0	6	0	1	8	3	0	0	0	2	3	0	0	0	5	7	0	5	0	11	0	17	28	11	56	8.8
22	3	2	2	S	L	N	H	1	0	4	0	0	0	0	2	5	5	0	0	0	0	0	0	0	3	2	4	0	3	0	9	0	12	21	5	38	7.6
23	3	2	2	S	H	S	L	1	0	1	0	0	5	0	1	5	1	0	0	1	1	7	0	0	0	3	6	0	5	0	10	0	16	24	7	47	8.0
24	3	2	2	C	H	N	H	1	4	1	0	0	6	0	0	2	2	1	0	0	10	2	0	0	0	8	4	0	3	0	7	8	17	30	12	59	9.4
25	3	2	2	C	L	S	H	6	0	1	0	0	0	0	2	2	1	6	0	0	11	3	1	0	0	1	1	0	3	0	6	2	26	13	7	46	8.0
26	3	2	2	C	L	S	L	5	2	0	0	0	0	0	0	3	4	4	0	0	12	2	0	0	2	1	5	0	0	0	2	6	25	16	7	48	8.0
27	3	2	2	S	H	N	L	1	0	2	0	0	2	0	3	8	3	0	0	1	0	1	4	0	2	4	4	0	4	0	9	0	20	23	5	48	9.5
28	3	2	2	C	H	S	L	0	2	0	0	0	2	5	1	4	4	4	0	0	3	3	0	0	1	5	2	0	6	0	5	6	19	25	9	53	12.4
29	3	2	2	C	H	S	H	0	10	0	0	0	0	9	3	3	1	2	0	0	5	6	0	0	0	2	4	0	5	0	10	6	20	27	19	66	9.8
30	3	2	2	S	L	S	L	2	0	0	0	0	1	0	2	7	4	0	0	0	0	4	3	0	1	5	4	0	4	0	9	0	20	23	3	46	8.9
31	3	2	2	C	L	N	L	3	2	6	0	0	0	0	0	1	0	3	0	0	17	0	0	0	1	0	2	0	0	0	1	0	21	4	11	36	3.7

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
32	3	2	2	S	L	N	L	5	0	6	0	0	0	0	0	7	0	1	0	0	1	0	0	0	0	0	3	0	2	0	2	0	9	7	11	27	5.7
33	3	2	3	C	L	S	L	1	0	0	0	0	0	0	1	1	4	9	0	0	15	2	0	0	0	0	4	0	1	0	5	4	32	14	1	47	5.7
34	3	2	3	S	L	N	L	0	0	0	0	0	4	0	1	2	0	0	0	0	0	0	0	0	0	0	3	0	1	0	1	1	3	6	4	13	5.1
35	3	2	3	C	L	N	L	1	2	1	0	0	0	0	1	2	1	4	0	0	9	1	0	0	0	1	1	0	0	0	4	3	18	9	4	31	7.0
36	3	2	3	S	L	S	L	2	0	0	0	0	0	0	1	7	0	1	0	0	1	2	0	0	0	1	1	0	0	0	3	0	12	5	2	19	5.1
37	3	2	3	S	H	S	L	0	0	2	0	0	4	0	2	5	4	0	0	0	0	7	0	0	1	4	3	0	3	0	3	0	18	14	6	38	9.1
38	3	2	3	C	H	S	L	1	2	4	0	0	3	0	3	4	2	5	0	0	6	4	0	0	2	1	4	0	3	0	8	8	24	26	10	60	12.2
39	3	2	3	S	H	N	L	7	0	1	0	0	0	0	1	16	2	0	0	0	0	4	0	0	1	2	6	0	2	0	6	0	23	17	8	48	5.6
40	3	2	3	S	L	N	H	3	0	4	0	0	0	0	3	4	0	0	0	0	0	0	1	0	2	1	5	0	2	0	2	0	8	12	7	27	8.2
41	3	2	3	S	H	N	H	0	0	0	0	0	5	0	2	5	0	5	0	0	9	4	0	0	1	2	7	0	0	0	9	0	25	19	5	49	7.7
42	3	2	3	C	H	S	H	1	2	0	0	0	6	9	1	6	2	5	0	0	7	8	2	0	1	2	2	0	3	0	2	5	31	15	18	64	11.6
43	3	2	3	S	H	S	H	2	0	0	0	0	4	0	3	5	1	0	0	0	4	4	3	0	0	2	2	0	4	0	8	0	20	16	6	42	9.6
44	3	2	3	C	L	N	H	2	2	0	0	0	2	0	0	3	0	3	0	0	15	0	0	0	0	1	3	0	3	0	6	5	21	18	6	45	6.0
45	3	2	3	C	H	N	H	1	1	0	0	0	4	0	1	1	1	7	0	0	4	4	0	0	3	2	8	0	4	0	5	3	18	25	6	49	10.5
46	3	2	3	S	L	S	H	4	0	2	0	0	0	0	4	7	3	1	0	0	0	3	1	0	0	3	4	0	6	0	6	0	19	19	6	44	9.6
47	3	2	3	C	H	N	L	0	5	0	0	0	2	0	1	3	3	3	0	0	7	1	0	0	0	3	1	0	5	0	2	5	18	16	7	41	9.8
48	3	2	3	C	L	S	H	0	0	0	0	0	0	0	3	6	1	3	0	0	9	2	0	0	0	2	0	0	6	0	3	3	24	14	0	38	7.3
49	3	2	4	S	L	S	L	2	0	2	0	0	2	0	2	7	6	1	0	0	1	3	0	0	0	4	8	0	2	0	3	0	20	17	6	43	9.0
50	3	2	4	S	H	N	L	4	0	3	0	0	4	0	0	11	3	0	0	0	0	0	0	0	2	8	6	0	8	0	8	0	14	32	11	57	8.1
51	3	2	4	S	L	N	L	3	0	10	0	0	2	0	0	7	0	0	0	0	0	0	0	0	0	3	6	0	1	0	6	0	7	16	15	38	5.9
52	3	2	4	C	H	S	L	1	4	7	0	0	0	0	2	9	0	0	0	0	0	3	0	0	0	0	0	0	0	0	5	0	14	5	12	31	5.2
53	3	2	4	C	L	N	H	3	1	0	0	0	1	0	0	2	1	9	0	0	10	0	0	0	0	1	4	0	1	0	3	4	22	13	5	40	6.7
54	3	2	4	S	H	S	H	1	0	3	0	0	0	0	0	6	3	0	0	0	0	10	0	0	2	6	7	0	6	0	12	0	19	33	4	56	7.4
55	3	2	4	C	H	N	H	2	5	3	0	0	6	0	0	2	7	7	0	0	10	4	0	0	1	3	4	0	0	0	8	5	30	21	16	67	11.0
56	3	2	4	C	L	N	L	4	0	3	0	0	3	0	0	0	0	6	0	0	8	0	0	0	1	2	2	0	1	0	6	3	14	15	10	39	8.0
57	3	2	4	S	L	N	H	7	0	11	0	0	0	0	1	5	1	0	0	0	0	0	0	0	2	0	2	0	1	0	5	0	7	10	18	35	5.3
58	3	2	4	S	L	S	H	5	0	0	0	0	0	0	5	4	5	0	0	0	4	2	1	0	4	0	5	0	5	0	9	0	21	23	5	49	9.3
59	3	2	4	C	L	S	L	3	1	0	0	0	0	1	1	3	1	7	0	0	1	2	0	0	0	2	3	0	4	0	6	5	15	20	5	40	9.6
60	3	2	4	S	H	N	H	8	0	0	0	0	1	0	2	5	1	2	0	0	0	2	0	0	3	7	4	0	3	0	9	0	12	26	9	47	8.3
61	3	2	4	C	H	N	L	0	1	2	0	0	2	4	0	0	1	4	0	0	7	1	0	0	0	3	3	0	3	0	3	5	13	17	9	39	9.9
62	3	2	4	C	H	S	H	0	0	0	0	0	3	10	4	0	3	7	0	0	5	5	0	0	0	4	3	0	2	0	6	5	24	20	13	57	10.1
63	3	2	4	S	H	S	L	0	0	0	0	0	3	0	1	4	4	0	0	1	3	6	3	0	0	6	5	0	5	0	7	0	22	23	3	48	9.9
64	3	2	4	C	L	S	H	0	2	3	0	0	2	0	1	8	6	2	0	0	10	4	0	0	2	1	4	0	1	0	5	6	31	19	7	57	10.1
65	3	2	5	S	L	N	L	5	0	0	0	0	0	0	2	7	1	0	0	0	2	0	0	0	2	0	3	0	2	0	2	0	12	9	5	26	6.5
66	3	2	5	S	H	S	H	4	0	5	0	0	5	0	5	3	6	0	0	0	0	9	0	0	1	5	7	0	6	0	8	1	23	28	14	65	10.8

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
67	3	2	5	S	L	N	H	3	0	1	0	0	0	0	1	11	2	0	0	0	0	0	0	0	1	2	5	0	3	0	7	0	14	18	4	36	5.8
68	3	2	5	C	H	S	H	1	1	2	0	0	5	12	6	3	3	9	0	0	11	11	0	0	1	5	8	0	0	0	7	3	43	24	21	88	11.1
69	3	2	5	S	H	S	L	2	1	6	0	0	1	0	2	3	4	0	0	0	4	5	0	0	1	0	11	0	3	0	8	0	18	23	10	51	8.5
70	3	2	5	S	H	N	H	5	1	7	0	0	2	0	3	11	4	0	0	0	0	3	0	0	0	4	10	0	2	0	7	0	21	23	15	59	8.6
71	3	2	5	C	H	N	L	2	4	0	0	0	2	0	3	3	0	2	0	0	8	0	3	0	2	2	5	0	4	0	2	2	19	17	8	44	11.0
72	3	2	5	S	L	S	H	0	0	2	0	0	0	0	6	6	5	0	0	0	0	4	0	0	1	1	8	0	1	0	7	1	21	19	2	42	7.5
73	3	2	5	C	L	N	H	2	1	3	0	0	1	0	2	0	2	5	0	0	16	1	0	0	3	1	6	0	2	0	6	2	26	20	7	53	7.1
74	3	2	5	C	H	S	L	0	4	4	0	0	1	10	3	4	0	3	0	1	8	4	0	0	1	0	5	0	4	0	4	2	23	16	19	58	10.9
75	3	2	5	C	L	S	L	0	2	0	0	0	0	0	1	3	1	3	0	0	7	0	0	0	0	0	4	0	3	0	1	1	15	9	2	26	6.8
76	3	2	5	S	H	N	L	2	0	7	0	0	5	0	2	2	3	0	0	0	4	0	0	0	0	6	4	0	3	0	5	0	11	18	14	43	9.4
77	3	2	5	C	H	N	H	0	4	0	0	0	5	0	0	0	3	7	0	0	7	0	0	0	0	3	3	0	1	0	3	4	17	14	9	40	8.3
78	3	2	5	S	L	S	L	0	0	0	0	0	3	0	4	5	4	1	0	0	0	4	0	0	0	3	4	0	2	0	7	1	18	17	3	38	8.9
79	3	2	5	C	L	S	H	0	3	0	0	0	4	0	0	0	4	4	0	0	9	1	4	0	0	3	5	0	3	0	3	3	22	17	7	46	9.8
80	3	2	5	C	L	N	L	1	2	0	0	0	1	0	0	2	0	4	0	0	4	1	0	0	0	0	3	0	1	0	3	2	11	9	4	24	8.7
1	3	3	1	C	H	S	H	5	3	0	0	0	0	0	0	0	2	8	0	0	7	4	0	0	0	1	7	0	0	0	9	7	21	24	8	53	8.1
2	3	3	1	C	H	N	H	8	2	5	0	0	2	0	6	1	2	9	0	0	19	0	2	0	4	1	4	0	0	0	8	3	39	20	17	76	8.4
3	3	3	1	S	L	S	L	1	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	4	2	1	7	3.8
4	3	3	1	S	L	N	L	8	0	3	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	11	13	2.2
5	3	3	1	S	H	S	L	8	0	3	0	0	3	0	3	3	5	0	0	0	0	1	1	0	1	1	5	0	4	0	10	0	13	21	14	48	8.5
6	3	3	1	S	H	S	H	3	0	0	0	0	2	0	6	8	7	1	0	0	4	3	0	0	1	1	4	0	4	0	8	0	29	18	5	52	9.5
7	3	3	1	C	H	S	L	0	5	1	0	0	1	2	3	5	4	5	0	0	0	6	0	0	1	2	4	0	0	0	5	0	23	12	9	44	10.3
8	3	3	1	C	L	S	H	0	0	0	0	0	0	0	2	2	0	10	0	0	21	1	0	0	0	1	2	0	1	0	2	0	36	6	0	42	3.2
9	3	3	1	C	L	S	H	4	0	0	0	0	0	0	2	1	0	11	0	4	4	1	0	0	0	0	0	0	1	0	2	0	23	3	4	30	5.0
10	3	3	1	C	L	N	H	0	0	2	0	0	0	0	0	0	0	2	0	0	6	0	0	0	0	1	0	0	0	0	0	0	8	1	2	11	2.7
11	3	3	1	S	H	N	L	12	0	6	0	0	2	0	7	5	5	0	0	0	0	0	0	0	0	2	5	0	1	0	10	0	17	18	20	55	7.3
12	3	3	1	C	L	N	L	1	0	0	0	0	0	0	1	0	1	2	0	0	14	0	0	0	0	0	1	0	0	0	1	2	18	4	1	23	2.5
13	3	3	1	C	H	N	L	1	5	1	0	0	3	0	4	1	1	3	0	0	14	5	1	0	1	2	3	0	4	0	4	3	29	17	10	56	9.2
14	3	3	1	S	H	N	H	6	1	3	0	0	2	0	7	3	4	1	0	0	4	3	7	0	1	3	5	0	4	0	10	1	29	24	12	65	12.0
15	3	3	1	S	L	S	H	0	0	0	0	0	1	0	5	5	4	1	0	0	2	4	0	0	0	1	2	0	0	0	2	0	21	5	1	27	7.5
16	3	3	1	S	L	N	H	8	0	0	0	0	4	0	2	7	3	0	0	0	0	0	0	0	1	0	3	0	1	0	3	1	12	9	12	33	6.7
17	3	3	2	S	L	S	H	8	0	0	0	0	0	0	3	6	3	2	0	0	2	4	0	0	1	5	5	0	4	0	13	0	20	28	8	56	8.3
18	3	3	2	C	H	N	L	0	2	0	0	0	3	0	0	2	1	6	0	0	17	0	0	0	0	6	4	0	3	0	8	5	26	26	5	57	6.6
19	3	3	2	S	H	S	H	0	0	0	0	0	6	0	2	6	3	0	0	0	0	9	2	0	0	7	6	0	5	0	9	0	22	27	6	55	8.4
20	3	3	2	C	L	N	H	4	0	1	0	0	0	0	2	2	0	6	0	0	7	0	0	0	0	0	3	0	0	0	7	3	17	13	5	35	6.9
21	3	3	2	S	H	N	H	5	0	0	0	0	8	0	1	8	3	1	0	1	1	2	0	0	1	5	2	0	4	0	11	0	17	23	13	53	8.3

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
22	3	3	2	S	L	N	H	7	0	4	0	0	0	0	1	5	5	2	0	0	0	0	0	0	3	1	5	0	3	0	11	0	13	23	11	47	7.8
23	3	3	2	S	H	S	L	0	0	0	0	0	8	0	1	10	3	0	0	0	0	6	0	0	3	3	2	0	6	0	15	0	20	29	8	57	6.6
24	3	3	2	C	H	N	H	5	6	0	0	0	5	0	1	5	2	2	0	0	9	4	0	0	2	4	3	0	5	0	1	9	23	24	16	63	11.2
25	3	3	2	C	L	S	H	9	0	0	0	0	0	0	2	2	1	6	0	0	10	3	0	0	1	1	0	0	3	0	5	2	24	12	9	45	7.4
26	3	3	2	C	L	S	L	5	2	0	0	0	0	0	0	4	5	5	0	0	9	2	0	0	2	1	6	0	0	0	2	4	25	15	7	47	9.2
27	3	3	2	S	H	N	L	1	0	2	0	0	5	0	5	9	4	0	0	0	3	2	2	0	2	3	3	0	2	0	10	0	25	20	8	53	9.5
28	3	3	2	C	H	S	L	1	8	3	0	0	5	7	2	7	5	7	0	0	4	3	0	0	4	3	4	0	4	0	4	5	28	24	24	76	14.5
29	3	3	2	C	H	S	H	0	10	0	0	0	0	10	3	2	1	5	0	0	8	11	0	0	0	4	2	0	2	0	14	7	30	29	20	79	9.0
30	3	3	2	S	L	S	L	6	0	0	0	0	1	0	2	6	4	1	0	0	0	5	2	0	1	3	4	0	2	0	9	0	20	19	7	46	9.0
31	3	3	2	C	L	N	L	9	2	3	0	0	0	0	0	0	0	4	0	0	16	0	0	0	1	0	2	0	0	0	2	0	20	5	14	39	4.1
32	3	3	2	S	L	N	L	11	0	5	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	5	0	3	0	2	0	5	10	16	31	4.6
33	3	3	3	C	L	S	L	3	1	0	0	0	0	0	1	2	4	12	0	0	15	2	0	0	0	0	5	0	1	0	5	5	36	16	4	56	6.5
34	3	3	3	S	L	N	L	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	4	0	0	0	4	0	0	0	3	1	7	8	0	15	4.4
35	3	3	3	C	L	N	L	2	1	0	0	0	0	0	1	1	1	4	0	0	13	0	0	0	0	1	1	0	0	0	5	4	20	11	3	34	4.9
36	3	3	3	S	L	S	L	3	0	1	0	0	0	0	2	6	0	0	0	0	0	4	0	0	0	1	1	0	0	0	4	0	12	6	4	22	5.8
37	3	3	3	S	H	S	L	3	0	0	0	0	4	0	2	8	4	2	0	0	1	8	0	0	1	4	2	0	2	0	5	0	25	14	7	46	9.3
38	3	3	3	C	H	S	L	2	1	5	0	0	5	0	1	4	2	6	0	0	7	6	0	0	2	1	5	0	2	0	8	8	26	26	13	65	11.8
39	3	3	3	S	H	N	L	11	0	2	0	0	0	0	1	12	2	0	0	0	0	2	0	0	1	2	4	0	2	0	9	0	17	18	13	48	6.0
40	3	3	3	S	L	N	H	3	0	4	0	0	0	0	2	7	0	0	0	0	0	0	0	0	3	2	6	0	1	0	3	0	9	15	7	31	7.0
41	3	3	3	S	H	N	H	1	0	0	0	0	4	0	2	5	0	3	0	0	6	4	0	0	1	2	10	0	2	0	9	0	20	24	5	49	8.1
42	3	3	3	C	H	S	H	0	3	11	0	0	8	7	1	9	3	5	0	0	7	9	3	0	4	1	2	0	3	0	4	4	37	18	29	84	12.6
43	3	3	3	S	H	S	H	3	0	1	0	0	5	0	0	8	0	1	0	0	1	5	0	0	1	2	2	0	5	0	10	0	15	20	9	44	7.4
44	3	3	3	C	L	N	H	0	3	2	0	0	3	0	2	1	0	3	0	0	12	0	0	0	0	1	3	0	2	0	6	6	18	18	8	44	7.3
45	3	3	3	C	H	N	H	4	0	1	0	0	4	0	2	4	0	4	0	0	3	5	0	0	2	3	3	0	2	0	3	4	18	17	9	44	12.6
46	3	3	3	S	L	S	H	7	0	0	0	0	0	0	2	9	3	1	0	0	0	3	0	0	2	3	3	0	8	0	6	0	18	22	7	47	8.0
47	3	3	3	C	H	N	L	0	5	0	0	0	3	0	0	2	2	4	0	0	8	1	0	0	0	2	0	0	7	0	0	7	17	16	8	41	7.5
48	3	3	3	C	L	S	H	0	0	0	0	0	0	0	5	4	1	7	0	0	8	2	0	0	1	1	0	0	4	0	2	3	27	11	0	38	7.6
49	3	3	4	S	L	S	L	4	0	0	0	0	1	0	1	4	4	0	0	0	0	2	0	0	0	3	6	0	1	0	2	0	11	12	5	28	7.5
50	3	3	4	S	H	N	L	5	0	3	0	0	3	0	0	8	2	0	0	0	0	0	0	0	1	6	8	0	5	0	6	0	10	26	11	47	8.1
51	3	3	4	S	L	N	L	9	0	6	0	0	3	0	0	5	0	0	0	0	3	0	0	0	0	2	5	0	1	0	7	0	8	15	18	41	7.0
52	3	3	4	C	H	S	L	6	3	5	0	0	1	0	2	7	0	0	0	0	0	1	0	0	0	0	2	0	0	0	4	0	10	6	15	31	6.6
53	3	3	4	C	L	N	H	2	1	3	0	0	1	0	0	4	1	9	0	0	10	0	0	0	0	2	4	0	0	0	4	3	24	13	7	44	7.5
54	3	3	4	S	H	S	H	2	0	0	0	0	0	0	0	8	3	2	0	0	1	10	0	0	6	6	4	0	6	0	19	0	24	41	2	67	6.7
55	3	3	4	C	H	N	H	4	2	2	0	0	7	0	3	2	6	6	0	0	7	3	0	0	0	2	6	0	0	0	9	6	27	23	15	65	11.3
56	3	3	4	C	L	N	L	6	0	0	0	0	5	0	0	0	1	6	0	0	3	0	0	0	2	2	1	0	0	0	4	3	10	12	11	33	7.7

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
57	3	3	4	S	L	N	H	15	0	3	0	0	0	0	1	6	1	0	0	0	0	0	0	0	2	0	2	0	1	0	5	0	8	10	18	36	4.2
58	3	3	4	S	L	S	H	7	0	0	0	0	0	0	5	4	3	1	0	0	2	4	1	0	2	1	3	0	3	0	8	0	20	17	7	44	9.3
59	3	3	4	C	L	S	L	4	2	1	0	0	0	0	1	2	0	10	0	0	3	2	0	0	1	2	2	0	3	0	7	7	18	22	7	47	8.7
60	3	3	4	S	H	N	H	5	0	0	0	0	2	0	3	7	1	0	0	0	0	2	0	0	1	8	4	0	1	0	10	0	13	24	7	44	7.1
61	3	3	4	C	H	N	L	1	1	1	0	0	2	3	0	3	1	5	0	0	7	0	0	0	0	3	3	0	3	0	2	3	16	14	8	38	10.3
62	3	3	4	C	H	S	H	1	2	3	0	0	2	10	7	3	4	7	0	0	5	9	0	0	0	2	3	0	1	0	8	5	35	19	18	72	11.5
63	3	3	4	S	H	S	L	1	0	0	0	0	2	0	2	1	5	0	0	1	2	7	0	0	3	6	3	0	4	0	7	0	18	23	3	44	9.3
64	3	3	4	C	L	S	H	1	2	0	0	0	2	0	1	7	6	5	0	0	10	2	0	0	2	1	2	0	1	0	5	7	31	18	5	54	9.5
65	3	3	5	S	L	N	L	5	1	0	0	0	1	0	1	1	2	4	0	2	12	0	0	0	2	1	6	0	3	0	6	3	22	21	7	50	8.6
66	3	3	5	S	H	S	H	4	5	7	0	0	1	7	2	5	2	3	0	1	5	5	1	0	1	0	2	0	2	0	4	1	24	10	24	58	12.9
67	3	3	5	S	L	N	H	0	1	0	0	0	0	0	1	2	1	3	0	0	9	1	0	0	0	0	3	0	4	0	2	1	17	10	1	28	6.1
68	3	3	5	C	H	S	H	3	0	0	0	0	4	0	6	6	2	1	0	0	4	0	0	0	0	5	3	0	3	0	5	0	19	16	7	42	9.5
69	3	3	5	S	H	S	L	0	3	0	0	0	5	0	1	3	5	6	0	0	8	1	0	0	0	4	4	0	1	0	5	4	24	18	8	50	10.2
70	3	3	5	S	H	N	H	0	0	0	0	0	2	0	5	5	4	1	0	0	0	6	1	0	0	4	5	0	1	0	10	1	22	21	2	45	8.1
71	3	3	5	C	H	N	L	0	3	0	0	0	4	0	0	0	6	3	0	0	9	2	2	0	0	2	5	0	2	0	3	3	22	15	7	44	9.2
72	3	3	5	S	L	S	H	4	2	1	0	0	1	0	0	5	0	5	0	0	2	1	0	0	0	0	4	0	1	0	2	2	13	9	8	30	8.8
73	3	3	5	C	L	N	H	5	0	0	0	0	0	0	1	9	1	1	0	0	2	0	0	0	3	0	4	0	1	0	4	0	14	12	5	31	6.2
74	3	3	5	C	H	S	L	3	0	5	0	0	3	0	4	6	7	0	0	0	1	11	0	0	0	6	6	0	5	0	12	0	29	29	11	69	9.4
75	3	3	5	C	L	S	L	5	0	0	0	0	0	0	1	10	2	0	0	0	1	0	0	0	2	3	5	0	3	0	6	0	14	19	5	38	6.7
76	3	3	5	S	H	N	L	3	1	4	0	0	4	12	6	3	2	10	0	0	10	10	0	0	1	5	4	0	0	0	5	3	41	18	24	83	11.3
77	3	3	5	C	H	N	H	11	1	0	0	0	2	0	3	6	5	0	0	0	6	7	0	0	1	1	8	0	4	0	10	0	27	24	14	65	9.1
78	3	3	5	S	L	S	L	6	0	0	0	0	2	0	4	10	5	0	0	0	0	3	0	0	0	3	8	0	1	0	7	0	22	19	8	49	7.7
79	3	3	5	C	L	S	H	1	3	0	0	0	2	0	3	5	0	2	0	0	5	0	5	0	1	2	4	0	5	0	2	2	20	16	6	42	11.3
80	3	3	5	C	L	N	L	2	0	1	0	0	0	0	5	8	6	0	0	0	1	2	0	0	0	1	7	0	1	0	8	0	22	17	3	42	7.1
1	3	4	1	C	H	S	H	7	6	6	0	0	0	0	0	2	3	13	0	0	7	8	0	0	0	2	6	0	0	0	8	8	33	24	19	76	9.9
2	3	4	1	C	H	N	H	5	2	6	0	0	3	0	5	3	2	7	0	0	23	0	0	0	1	3	11	0	0	0	9	5	40	29	16	85	7.8
3	3	4	1	S	L	S	L	2	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	3	2	2	7	4.5
4	3	4	1	S	L	N	L	9	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	9	11	1.4
5	3	4	1	S	H	S	L	9	0	5	0	0	5	0	2	4	7	1	0	0	0	2	0	0	1	1	2	0	2	0	11	0	16	17	19	52	8.0
6	3	4	1	S	H	S	H	3	1	3	0	0	2	0	6	5	4	2	0	0	6	4	0	0	2	3	4	0	3	0	7	0	27	19	9	55	12.4
7	3	4	1	C	H	S	L	0	7	5	0	0	1	3	4	5	4	10	0	1	2	9	0	0	0	2	4	0	0	0	5	2	35	13	16	64	10.9
8	3	4	1	C	L	S	H	0	1	1	0	0	1	0	3	5	0	7	0	0	13	2	0	0	0	1	3	0	0	0	1	1	30	6	3	39	5.6
9	3	4	1	C	L	S	H	5	0	1	0	0	0	0	2	2	0	14	0	4	2	2	0	0	0	0	0	0	1	0	1	0	26	2	6	34	4.5
10	3	4	1	C	L	N	H	0	0	0	0	0	0	0	1	0	0	4	0	0	7	0	0	0	0	1	0	0	0	0	0	0	12	1	0	13	2.5
11	3	4	1	S	H	N	L	9	0	13	0	0	6	0	6	4	5	0	0	0	0	0	0	0	0	4	6	0	2	0	11	0	15	23	28	66	8.1

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
12	3	4	1	C	L	N	L	3	0	0	0	0	0	0	1	0	1	3	0	0	13	0	0	0	0	0	1	0	0	0	1	3	18	5	3	26	3.4
13	3	4	1	C	H	N	L	0	7	3	0	0	4	0	3	5	2	4	0	0	8	3	2	0	1	5	3	0	1	0	5	3	27	18	14	59	12.7
14	3	4	1	S	H	N	H	4	1	12	0	0	6	0	5	3	3	0	0	0	1	8	4	0	2	6	5	0	4	0	12	2	24	31	23	78	11.1
15	3	4	1	S	L	S	H	0	0	1	0	0	1	0	1	2	3	1	0	0	2	4	0	0	1	1	3	0	0	0	2	0	13	7	2	22	9.3
16	3	4	1	S	L	N	H	7	0	2	0	0	4	0	2	9	3	0	0	0	0	0	0	0	1	0	5	0	3	0	2	2	14	13	13	40	7.8
17	3	4	2	S	L	S	H	10	0	0	0	0	1	0	3	10	5	0	0	0	3	5	0	0	2	6	10	0	5	0	19	0	26	42	11	79	7.9
18	3	4	2	C	H	N	L	0	4	2	0	0	7	0	0	3	3	8	0	0	16	1	1	0	0	6	6	0	4	0	9	7	32	32	13	77	9.5
19	3	4	2	S	H	S	H	0	1	2	0	0	4	0	2	6	5	1	0	0	0	8	2	0	0	8	3	0	3	0	10	0	24	24	7	55	9.0
20	3	4	2	C	L	N	H	3	0	0	0	0	0	0	3	3	0	6	0	0	11	1	0	0	0	0	0	0	0	0	7	3	24	10	3	37	5.6
21	3	4	2	S	H	N	H	4	0	2	0	0	9	0	3	8	2	2	0	0	1	1	0	0	1	5	7	0	6	0	13	0	17	32	15	64	8.8
22	3	4	2	S	L	N	H	9	0	2	0	0	1	0	2	8	6	0	0	0	0	0	0	0	3	1	5	0	2	0	9	0	16	20	12	48	7.4
23	3	4	2	S	H	S	L	0	0	0	0	0	7	0	2	10	3	0	0	0	0	6	0	0	2	4	3	0	3	0	18	0	21	30	7	58	6.0
24	3	4	2	C	H	N	H	6	3	2	0	0	5	0	0	8	3	2	0	0	8	5	0	0	3	7	0	0	6	0	7	7	26	30	16	72	12.0
25	3	4	2	C	L	S	H	11	0	0	0	0	0	0	1	2	1	10	0	0	12	1	0	0	1	0	0	0	3	0	8	2	27	14	11	52	6.0
26	3	4	2	C	L	S	L	5	2	8	0	0	0	0	0	5	4	5	0	0	14	4	0	0	2	1	4	0	0	0	3	4	32	14	15	61	8.9
27	3	4	2	S	H	N	L	4	0	4	0	0	3	0	4	7	5	0	0	0	1	2	0	0	2	2	5	0	5	0	13	0	19	27	11	57	9.0
28	3	4	2	C	H	S	L	0	6	9	0	0	4	9	4	8	5	7	0	0	5	4	0	0	1	5	4	0	4	0	6	4	33	24	28	85	13.9
29	3	4	2	C	H	S	H	1	8	3	0	0	5	12	3	3	1	5	0	0	6	11	0	0	0	3	2	0	4	0	16	12	29	37	29	95	10.3
30	3	4	2	S	L	S	L	3	0	0	0	0	1	0	3	5	7	0	0	0	0	2	1	0	1	4	2	0	3	0	8	0	18	18	4	40	8.3
31	3	4	2	C	L	N	L	9	1	6	0	0	0	0	0	1	0	4	0	0	19	0	0	0	1	0	1	0	0	0	2	0	24	4	16	44	3.9
32	3	4	2	S	L	N	L	10	0	7	0	0	0	0	1	8	0	0	0	0	0	0	0	0	0	0	2	0	3	0	3	0	9	8	17	34	4.9
33	3	4	3	C	L	S	L	2	0	1	0	0	0	0	1	2	3	11	0	0	12	2	0	0	0	0	2	0	0	0	6	3	31	11	3	45	6.0
34	3	4	3	S	L	N	L	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	4	0	0	0	3	0	0	0	4	1	7	8	0	15	4.8
35	3	4	3	C	L	N	L	1	1	0	0	0	0	0	3	1	0	3	0	0	11	0	0	0	0	0	1	0	0	0	3	3	18	7	2	27	4.5
36	3	4	3	S	L	S	L	3	0	0	0	0	0	0	2	4	0	0	0	0	0	2	0	0	0	1	2	0	0	0	5	0	8	8	3	19	5.7
37	3	4	3	S	H	S	L	2	0	0	0	0	3	0	2	8	6	1	0	0	2	7	0	0	2	4	0	0	3	0	4	0	26	13	5	44	9.0
38	3	4	3	C	H	S	L	1	0	8	0	0	4	0	1	3	2	8	0	0	8	4	0	0	2	1	3	0	1	0	7	8	26	22	13	61	10.1
39	3	4	3	S	H	N	L	9	0	0	0	0	0	0	2	13	3	0	0	0	0	3	0	0	1	2	5	0	2	0	7	0	21	17	9	47	6.2
40	3	4	3	S	L	N	H	4	0	3	0	0	0	0	3	5	0	0	0	0	0	0	0	0	2	1	6	0	1	0	2	0	8	12	7	27	6.9
41	3	4	3	S	H	N	H	1	0	1	0	0	3	0	4	4	0	4	0	0	10	7	0	0	1	1	6	0	1	0	9	0	29	18	5	52	8.2
42	3	4	3	C	H	S	H	2	2	12	0	0	6	8	2	5	2	4	0	0	11	13	4	0	2	2	0	0	2	0	7	5	41	18	30	89	11.4
43	3	4	3	S	H	S	H	3	0	2	0	0	6	0	1	7	1	0	0	3	4	5	0	0	1	3	3	0	4	0	10	0	21	21	11	53	9.9
44	3	4	3	C	L	N	H	2	1	0	0	0	4	0	0	3	0	4	0	0	12	0	0	0	0	0	4	0	4	0	6	5	19	19	7	45	7.2
45	3	4	3	C	H	N	H	3	1	0	0	0	6	0	2	2	1	3	0	0	5	7	0	0	2	2	7	0	3	0	10	6	20	30	10	60	10.6
46	3	4	3	S	L	S	H	7	0	0	0	0	0	0	4	8	4	2	0	0	0	3	1	0	2	3	4	0	4	0	7	0	22	20	7	49	9.5

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
47	3	4	3	C	H	N	L	1	7	1	0	0	3	0	2	2	3	3	0	0	7	1	0	0	0	1	1	0	5	0	4	5	18	16	12	46	10.4
48	3	4	3	C	L	S	H	0	0	0	0	0	0	0	2	5	0	6	0	0	12	4	0	0	3	1	2	0	5	0	2	4	29	17	0	46	7.5
49	3	4	4	S	L	S	L	5	0	1	0	0	2	0	4	6	5	0	0	0	1	4	0	0	0	2	9	0	3	0	2	0	20	16	8	44	8.7
50	3	4	4	S	H	N	L	11	0	2	0	0	3	0	1	3	2	2	0	0	0	0	0	0	1	6	5	0	6	0	7	0	8	25	16	49	8.0
51	3	4	4	S	L	N	L	9	0	2	0	0	3	0	0	5	0	0	0	0	0	0	0	0	0	2	5	0	1	0	7	0	5	15	14	34	5.8
52	3	4	4	C	H	S	L	3	4	10	0	0	1	0	4	9	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4	0	14	4	18	36	5.4
53	3	4	4	C	L	N	H	3	1	1	0	0	1	0	0	3	1	11	0	0	16	0	0	0	0	0	3	0	1	0	3	3	31	10	6	47	5.2
54	3	4	4	S	H	S	H	2	0	5	0	0	0	0	0	6	4	0	0	0	1	6	0	0	4	4	4	0	7	0	12	0	17	31	7	55	8.4
55	3	4	4	C	H	N	H	7	7	1	0	0	8	0	2	5	8	8	0	0	16	3	0	0	0	3	5	0	0	0	9	5	42	22	23	87	10.4
56	3	4	4	C	L	N	L	7	1	1	0	0	3	0	1	0	1	5	0	0	7	0	0	0	2	1	3	0	1	0	5	3	14	15	12	41	9.1
57	3	4	4	S	L	N	H	5	0	12	0	0	0	0	3	4	4	0	0	0	0	0	0	0	3	0	1	0	1	0	4	0	11	9	17	37	5.8
58	3	4	4	S	L	S	H	5	0	0	0	0	1	0	5	7	7	0	0	0	3	6	1	0	3	2	5	0	3	0	5	0	29	18	6	53	10.5
59	3	4	4	C	L	S	L	4	3	0	0	0	0	2	2	9	9	6	0	0	3	1	0	0	0	1	5	0	5	0	8	5	30	24	9	63	10.4
60	3	4	4	S	H	N	H	4	0	0	0	0	3	0	2	3	3	0	0	0	0	2	0	0	3	6	1	0	3	0	14	0	10	27	7	44	6.4
61	3	4	4	C	H	N	L	2	2	0	0	0	5	4	0	0	0	7	0	0	9	1	0	0	0	3	4	0	2	0	4	4	17	17	13	47	9.2
62	3	4	4	C	H	S	H	3	3	0	0	0	3	15	10	3	3	7	0	0	5	9	0	0	0	3	6	0	2	0	5	4	37	20	24	81	10.7
63	3	4	4	S	H	S	L	0	0	0	0	0	3	0	5	3	3	2	0	0	0	8	0	0	1	8	4	0	5	0	9	2	21	29	3	53	9.0
64	3	4	4	C	L	S	H	0	3	0	0	0	2	0	3	8	8	5	0	0	9	3	0	0	3	1	3	0	1	0	6	6	36	20	5	61	10.4
65	3	4	5	S	L	N	L	6	0	3	0	0	0	0	3	9	2	0	0	0	2	0	0	0	3	0	3	0	2	0	2	0	16	10	9	35	7.2
66	3	4	5	S	H	S	H	4	0	5	0	0	5	0	5	6	8	0	0	0	3	9	0	0	1	7	7	0	3	0	10	0	31	28	14	73	10.9
67	3	4	5	S	L	N	H	4	0	0	0	0	1	0	1	8	3	0	0	0	3	0	0	0	1	3	4	0	2	0	10	0	15	20	5	40	7.0
68	3	4	5	C	H	S	H	2	0	8	0	0	8	10	6	5	3	12	0	0	7	9	0	0	0	3	9	0	0	0	6	3	42	21	28	91	11.6
69	3	4	5	S	H	S	L	4	0	15	0	0	1	0	5	9	5	1	0	0	0	10	0	0	0	2	9	0	3	0	15	0	30	29	20	79	7.9
70	3	4	5	S	H	N	H	4	0	7	0	0	2	0	4	9	4	0	0	0	0	2	0	0	1	3	10	0	1	0	7	0	19	22	13	54	8.4
71	3	4	5	C	H	N	L	1	5	0	0	0	2	0	2	7	0	2	0	0	4	0	3	0	1	1	3	0	3	0	3	2	18	13	8	39	10.5
72	3	4	5	S	L	S	H	5	0	1	0	0	0	0	2	8	5	0	0	0	0	3	0	0	1	2	11	0	2	0	10	0	18	26	6	50	7.0
73	3	4	5	C	L	N	H	4	1	4	0	0	1	0	1	0	1	3	0	0	16	2	0	0	3	1	5	0	1	0	5	3	23	18	10	51	6.9
74	3	4	5	C	H	S	L	1	3	10	0	0	0	8	3	5	1	5	0	0	1	4	1	0	2	0	1	0	2	0	2	1	20	8	22	50	9.4
75	3	4	5	C	L	S	L	0	0	0	0	0	0	0	3	5	2	4	0	0	9	1	0	0	0	0	3	0	3	0	2	3	24	11	0	35	7.3
76	3	4	5	S	H	N	L	3	1	6	0	0	4	0	3	5	3	0	0	0	3	0	0	0	0	6	3	0	4	0	4	0	14	17	14	45	10.6
77	3	4	5	C	H	N	H	0	4	0	0	0	7	0	2	2	4	6	0	0	9	0	0	0	0	2	1	0	2	0	4	5	23	14	11	48	9.0
78	3	4	5	S	L	S	L	0	0	0	0	0	2	0	3	6	4	1	0	0	0	4	0	0	0	3	4	0	1	0	6	1	18	15	2	35	8.4
79	3	4	5	C	L	S	H	1	5	1	0	0	2	2	1	3	4	5	0	0	10	5	0	0	0	2	3	0	2	0	6	3	28	16	11	55	11.1
80	3	4	5	C	L	N	L	3	2	2	0	0	2	0	0	5	0	5	0	0	5	1	0	0	0	0	4	0	1	0	2	2	16	9	9	34	9.5
1	3	5	1	C	H	S	H	7	2	1	0	0	0	0	1	2	2	7	0	0	11	6	1	0	0	3	8	0	0	0	5	10	30	26	10	66	9.3

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
2	3	5	1	C	H	N	H	10	0	3	0	0	2	0	4	5	3	3	0	0	19	0	0	0	1	2	8	0	0	0	11	1	34	23	15	72	7.2
3	3	5	1	S	L	S	L	1	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	3	2	1	6	4.5
4	3	5	1	S	L	N	L	10	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	10	12	1.4
5	3	5	1	S	H	S	L	9	0	2	0	0	4	0	4	5	8	0	1	0	1	2	0	0	2	3	5	0	3	0	13	0	21	26	15	62	9.0
6	3	5	1	S	H	S	H	5	1	0	0	0	1	0	6	5	4	0	2	0	6	3	0	0	1	2	4	0	4	0	9	0	26	20	7	53	10.4
7	3	5	1	C	H	S	L	0	5	8	0	0	1	3	3	4	4	6	1	0	0	8	0	0	1	4	5	0	0	0	3	1	26	14	17	57	11.1
8	3	5	1	C	L	S	H	0	1	3	0	0	0	0	3	6	0	9	0	0	21	1	0	0	0	1	5	0	0	0	3	1	40	10	4	54	4.7
9	3	5	1	C	L	S	H	4	0	3	0	0	0	0	2	1	0	16	0	5	1	2	0	0	0	0	0	0	1	0	1	0	27	2	7	36	4.1
10	3	5	1	C	L	N	H	0	0	2	0	0	0	0	0	0	0	7	0	0	8	0	0	0	0	1	0	0	0	0	0	0	15	1	2	18	2.7
11	3	5	1	S	H	N	L	15	0	5	0	0	5	0	8	5	6	0	0	0	1	0	0	0	0	4	2	0	1	0	11	0	20	18	25	63	7.3
12	3	5	1	C	L	N	L	1	0	0	0	0	0	0	0	1	2	2	4	0	15	0	0	0	0	0	1	0	0	0	1	2	24	4	1	29	3.3
13	3	5	1	C	H	N	L	4	9	0	0	0	4	0	7	3	1	4	2	0	13	3	5	0	1	5	3	0	0	0	4	5	38	18	17	73	11.3
14	3	5	1	S	H	N	H	10	0	3	0	0	4	0	4	6	4	1	3	0	5	5	8	0	1	4	5	0	6	0	11	3	36	30	17	83	13.1
15	3	5	1	S	L	S	H	0	0	0	0	0	1	0	4	4	4	1	2	0	2	4	0	0	0	2	4	0	0	0	2	0	21	8	1	30	9.2
16	3	5	1	S	L	N	H	12	0	0	0	0	6	0	3	11	3	0	5	0	1	0	0	0	0	0	3	0	1	0	2	1	23	7	18	48	6.4
17	3	5	2	S	L	S	H	15	0	6	0	0	0	0	4	10	4	1	9	0	1	5	0	0	3	8	7	0	5	0	14	0	34	37	21	92	10.0
18	3	5	2	C	H	N	L	0	4	2	0	0	7	0	1	4	3	5	4	0	16	0	0	0	0	7	5	0	1	0	10	4	33	27	13	73	9.1
19	3	5	2	S	H	S	H	1	0	0	0	0	8	0	3	7	4	1	4	0	1	5	2	0	0	8	4	0	5	0	10	0	27	27	9	63	10.2
20	3	5	2	C	L	N	H	2	0	0	0	0	0	0	2	3	0	7	1	0	9	1	0	0	0	0	4	0	0	0	9	3	23	16	2	41	6.6
21	3	5	2	S	H	N	H	3	0	0	0	0	7	0	3	13	3	1	9	0	2	2	0	0	0	6	4	0	3	0	13	0	33	26	10	69	8.4
22	3	5	2	S	L	N	H	15	0	0	0	0	0	0	3	9	5	0	6	0	2	0	0	0	3	0	4	0	2	0	12	0	25	21	15	61	6.7
23	3	5	2	S	H	S	L	0	0	0	0	0	8	0	2	10	4	1	10	0	0	6	0	0	0	4	4	0	5	0	14	0	33	27	8	68	8.1
24	3	5	2	C	H	N	H	9	6	0	0	0	4	0	0	8	2	4	3	0	9	4	0	0	3	11	5	0	5	0	6	7	30	37	19	86	12.6
25	3	5	2	C	L	S	H	12	2	2	0	0	0	0	1	2	1	12	1	0	14	3	0	0	1	1	1	0	4	0	5	2	34	14	16	64	7.4
26	3	5	2	C	L	S	L	5	2	7	0	0	0	0	0	3	7	4	3	0	9	4	0	0	3	2	5	0	0	0	5	3	30	18	14	62	11.6
27	3	5	2	S	H	N	L	5	0	0	0	0	3	0	4	11	6	1	6	0	0	3	0	0	3	4	2	0	5	0	13	0	31	27	8	66	9.2
28	3	5	2	C	H	S	L	0	6	5	0	0	3	5	3	7	5	9	8	0	6	5	0	0	3	2	1	0	5	0	5	5	43	21	19	83	14.6
29	3	5	2	C	H	S	H	1	8	2	0	0	2	12	2	3	1	4	2	0	4	12	0	0	2	3	2	0	3	0	18	11	28	39	25	92	9.6
30	3	5	2	S	L	S	L	6	0	0	0	0	1	0	2	7	3	0	2	0	0	1	1	0	1	4	4	0	4	0	11	0	16	24	7	47	8.0
31	3	5	2	C	L	N	L	12	1	7	0	0	0	0	0	0	0	4	2	0	19	0	1	0	1	0	1	0	0	0	2	0	26	4	20	50	4.3
32	3	5	2	S	L	N	L	16	0	0	0	0	0	0	0	9	0	0	2	0	0	0	0	0	0	0	3	0	2	0	1	0	11	6	16	33	3.1
33	3	5	3	C	L	S	L	3	0	0	0	0	0	0	4	3	3	13	0	0	13	3	0	0	0	0	2	0	1	0	5	4	39	12	3	54	6.7
34	3	5	3	S	L	N	L	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	3	0	0	0	2	0	0	0	1	1	6	4	1	11	6.4
35	3	5	3	C	L	N	L	1	1	0	0	0	0	0	3	2	2	6	1	0	9	0	0	0	0	0	1	0	0	0	4	3	23	8	2	33	6.7
36	3	5	3	S	L	S	L	3	0	1	0	0	0	0	2	6	0	0	0	0	0	1	0	0	0	1	1	0	0	0	5	0	9	7	4	20	5.1

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
37	3	5	3	S	H	S	L	1	0	0	0	0	5	0	2	4	8	1	3	0	0	6	0	0	1	3	1	0	2	0	8	0	24	15	6	45	8.6
38	3	5	3	C	H	S	L	2	0	5	0	0	4	0	5	2	2	5	5	0	4	3	0	0	5	2	4	0	1	0	6	5	26	23	11	60	13.8
39	3	5	3	S	H	N	L	9	0	0	0	0	0	0	2	12	1	0	5	0	0	2	0	0	1	3	6	0	2	0	5	0	22	17	9	48	6.9
40	3	5	3	S	L	N	H	4	0	1	0	0	0	0	2	8	0	0	3	0	0	0	0	0	1	1	6	0	2	0	3	0	13	13	5	31	6.6
41	3	5	3	S	H	N	H	0	0	0	0	0	4	0	3	4	0	5	3	0	6	7	0	0	1	0	6	0	0	0	7	0	28	14	4	46	8.6
42	3	5	3	C	H	S	H	0	1	9	0	0	7	9	2	7	2	5	8	0	8	9	1	0	0	0	1	0	3	0	4	3	42	11	26	79	11.6
43	3	5	3	S	H	S	H	4	1	0	0	0	4	0	2	9	2	1	1	2	2	5	0	0	1	5	2	0	3	0	6	0	24	17	9	50	10.8
44	3	5	3	C	L	N	H	4	2	0	0	0	5	0	0	2	0	3	7	0	16	0	0	0	0	1	2	0	3	0	6	3	28	15	11	54	6.9
45	3	5	3	C	H	N	H	5	2	3	0	0	7	0	4	5	1	4	2	0	6	9	0	0	2	3	1	0	2	0	3	5	31	16	17	64	12.9
46	3	5	3	S	L	S	H	7	0	1	0	0	0	0	2	9	4	1	4	0	0	6	2	0	1	2	4	0	5	0	8	0	28	20	8	56	9.9
47	3	5	3	C	H	N	L	0	6	3	0	0	4	0	2	3	2	4	1	0	8	1	0	0	0	4	1	0	2	0	2	6	21	15	13	49	10.9
48	3	5	3	C	L	S	H	0	0	0	0	0	0	0	3	7	1	8	4	0	14	2	0	0	2	2	0	0	4	0	3	2	39	13	0	52	7.2
49	3	5	4	S	L	S	L	3	0	2	0	0	2	0	3	8	5	0	3	0	1	4	0	0	0	4	5	0	2	0	1	3	24	15	7	46	10.8
50	3	5	4	S	H	N	L	12	0	1	0	0	4	0	2	10	2	0	1	0	0	0	0	0	1	5	6	0	4	0	10	1	15	27	17	59	7.8
51	3	5	4	S	L	N	L	12	0	0	0	0	2	0	0	4	0	0	3	0	0	0	0	0	0	2	3	0	0	0	9	0	7	14	14	35	4.6
52	3	5	4	C	H	S	L	6	3	8	0	0	1	0	2	10	0	0	2	0	0	1	0	0	0	0	0	0	0	0	6	0	15	6	18	39	6.0
53	3	5	4	C	L	N	H	6	2	0	0	0	1	0	0	5	2	13	5	0	16	0	0	0	0	1	3	0	1	0	3	3	41	11	9	61	6.8
54	3	5	4	S	H	S	H	4	1	0	0	0	0	0	0	11	5	0	9	0	0	11	0	0	5	8	7	0	6	0	14	0	36	40	5	81	8.9
55	3	5	4	C	H	N	H	11	4	0	0	0	6	0	2	6	8	9	4	0	16	3	0	0	1	2	6	0	0	0	12	7	48	28	21	97	10.8
56	3	5	4	C	L	N	L	10	1	1	0	0	4	0	0	0	1	4	5	0	10	1	0	0	2	2	1	0	1	0	6	3	21	15	16	52	8.6
57	3	5	4	S	L	N	H	18	0	0	0	0	0	0	3	7	1	0	3	0	0	0	0	0	2	0	1	0	1	0	3	0	14	7	18	39	3.7
58	3	5	4	S	L	S	H	8	0	2	0	0	1	0	4	5	5	0	7	0	1	4	1	0	4	3	3	0	4	0	10	0	27	24	11	62	10.9
59	3	5	4	C	L	S	L	4	3	0	0	0	0	3	2	3	1	10	4	0	3	0	0	0	1	3	2	0	5	0	7	5	23	23	10	56	11.0
60	3	5	4	S	H	N	H	4	0	0	0	0	3	0	2	3	3	0	1	0	0	2	0	0	3	6	1	0	3	0	14	0	11	27	7	45	6.7
61	3	5	4	C	H	N	L	1	1	0	0	0	3	4	0	2	1	6	5	0	10	2	0	0	0	5	2	0	2	0	3	4	26	16	9	51	10.2
62	3	5	4	C	H	S	H	2	3	0	0	0	3	10	2	2	3	8	4	0	6	9	0	0	0	4	3	0	1	0	6	6	34	20	18	72	11.9
63	3	5	4	S	H	S	L	1	0	0	0	0	4	0	4	5	8	2	7	1	2	7	1	0	1	6	0	0	5	0	10	0	37	22	5	64	10.4
64	3	5	4	C	L	S	H	2	3	3	0	0	2	0	1	10	4	7	9	0	13	2	0	0	3	1	3	0	1	0	7	6	46	21	10	77	10.8
65	3	5	5	S	L	N	L	6	0	0	0	0	0	0	3	6	1	2	3	0	2	1	0	0	3	0	3	0	3	0	3	0	18	12	6	36	9.5
66	3	5	5	S	H	S	H	5	0	3	0	0	4	0	1	5	7	0	7	0	0	8	0	0	1	8	3	0	4	0	10	0	28	26	12	66	10.2
67	3	5	5	S	L	N	H	2	1	0	0	0	1	0	1	8	3	0	7	0	0	1	0	0	1	3	4	0	2	0	8	0	20	18	4	42	7.9
68	3	5	5	C	H	S	H	8	3	6	0	0	4	10	8	3	3	10	8	0	8	9	0	0	2	4	3	0	0	0	7	4	49	20	31	100	14.1
69	3	5	5	S	H	S	L	9	0	5	0	0	4	0	4	4	3	2	6	0	3	7	0	0	1	1	6	0	3	0	12	0	29	23	18	70	10.8
70	3	5	5	S	H	N	H	8	0	0	0	0	2	0	5	13	4	0	6	0	0	2	0	0	1	4	5	0	1	0	5	0	30	16	10	56	8.1
71	3	5	5	C	H	N	L	0	4	0	0	0	1	0	4	7	0	2	1	0	8	0	3	0	3	1	2	0	4	0	2	1	25	13	5	43	9.5

Unit	Year	Count	Block	Species Set	Groundwater Level	Stratification	Seeding Density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total	Simpson Diversity
72	3	5	5	S	L	S	H	1	1	0	0	0	0	0	5	9	6	0	7	0	0	4	0	0	0	1	9	0	3	0	9	0	31	22	2	55	7.9
73	3	5	5	C	L	N	H	3	1	2	0	0	2	0	1	1	2	6	5	0	13	1	0	0	3	1	4	0	1	0	7	4	29	20	8	57	9.4
74	3	5	5	C	H	S	L	0	2	12	0	0	3	8	2	7	2	1	3	0	5	7	0	0	2	0	3	0	3	0	3	3	27	14	25	66	10.
75	3	5	5	C	L	S	L	0	3	0	0	0	0	0	3	4	2	5	2	0	8	2	0	0	0	0	5	0	3	0	2	2	26	12	3	41	9.5
76	3	5	5	S	H	N	L	3	0	4	0	0	4	0	3	7	2	0	10	0	1	0	0	0	0	7	0	0	3	0	6	0	23	16	11	50	8.4
77	3	5	5	C	H	N	H	2	6	0	0	0	7	0	2	2	4	5	6	0	7	2	0	0	0	2	3	0	2	0	4	4	28	15	15	58	12.
78	3	5	5	S	L	S	L	0	0	0	0	0	4	0	3	7	6	1	10	0	3	7	0	0	0	4	2	0	3	0	10	1	37	20	4	61	9.3
79	3	5	5	C	L	S	H	0	5	6	0	0	2	0	0	2	7	3	2	0	6	3	0	0	0	3	4	0	2	0	14	4	23	27	13	63	9.5
80	3	5	5	C	L	N	L	7	2	0	0	0	1	0	0	3	0	6	5	0	10	1	0	0	0	0	4	0	2	0	2	2	25	10	10	45	8.0

Biomass Data

Number	Block	Species set	Groundwater level	Stratification	Seeding density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total
1	1	C	H	S	H	32.7	4.9	7.0	0.0	0.0	0.0	0.0	1.2	7.3	11.3	16.5	0.0	0.0	33.0	26.8	0.0	0.0	0.0	8.4	11.6	0.0	3.3	0.0	58.1	23.3	96.1	104.7	44.6	245.4
2	1	C	H	N	H	37.5	2.4	0.0	0.0	0.0	4.5	0.0	2.9	13.6	7.1	11.6	0.0	0.0	89.2	0.0	1.0	0.0	2.1	13.8	20.5	0.0	0.0	0.0	53.1	5.2	125.4	94.9	44.3	264.6
3	1	S	L	S	L	52.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.7	0.0	0.0	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	62.1	0.0	0.0	0.0	55.5	0.0	41.8	117.6	52.1	211.4
4	1	S	L	N	L	109.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.3	0.0	109.0	163.3
5	1	S	H	S	L	138.5	0.0	2.9	0.0	0.0	28.7	0.0	3.9	16.3	20.3	0.0	2.7	0.0	0.9	0.0	0.0	0.0	27.2	74.0	27.9	0.0	39.6	0.0	218.7	0.0	44.1	387.5	170.1	601.7
6	1	S	H	S	H	29.6	1.6	0.0	0.0	0.0	2.2	0.0	25.2	44.2	45.5	3.9	3.4	0.0	45.1	26.4	0.0	0.0	18.0	40.4	66.8	0.0	72.4	0.0	131.0	0.0	193.6	328.6	33.5	555.7
7	1	C	H	S	L	0.0	43.5	33.0	0.0	0.0	8.5	31.7	11.0	17.0	130.3	104.3	4.7	2.1	0.0	64.7	0.0	0.0	2.6	49.2	36.9	0.0	0.0	0.0	51.1	18.6	334.2	158.5	116.7	609.3
8	1	C	L	S	L	0.0	2.1	5.3	0.0	0.0	0.0	0.0	5.9	51.1	0.0	90.3	0.0	0.0	96.1	2.9	0.0	0.0	0.0	11.8	48.1	0.0	0.0	0.0	18.8	2.5	246.3	81.2	7.4	334.9
9	1	C	L	S	H	28.2	0.0	7.0	0.0	0.0	0.0	0.0	2.0	5.0	0.0	0.0	0.0	10.4	7.8	2.8	0.0	0.0	0.0	241.5	0.0	0.0	20.6	0.0	13.9	0.0	28.0	276.1	35.2	339.3
10	1	C	L	N	H	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	4.2	0.0	414.3	0.0	0.0	26.8	0.0	0.0	0.0	84.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	447.1	84.7	0.0	531.8
11	1	S	H	N	L	364.0	0.0	0.0	0.0	0.0	14.9	0.0	3.1	8.8	26.5	4.5	0.0	0.0	0.0	13.5	0.0	0.0	0.0	24.1	0.0	0.0	0.0	0.0	234.9	0.0	56.4	259.0	378.9	694.3
12	1	C	L	N	L	13.1	0.0	0.0	0.0	0.0	0.0	0.0	2.3	1.4	14.0	100.4	8.8	0.0	41.9	0.0	0.0	0.0	0.0	0.0	28.4	0.0	0.0	0.0	30.3	92.4	168.8	151.1	13.1	333.1
13	1	C	H	N	L	37.4	24.7	0.0	0.0	0.0	16.9	0.0	6.2	6.4	7.5	19.8	1.6	0.7	34.8	10.3	2.0	0.0	0.0	50.0	5.3	0.0	46.8	0.0	139.9	38.1	89.4	280.1	78.9	448.4
14	1	S	H	N	H	137.9	0.0	0.0	0.0	0.0	14.5	0.0	18.3	23.3	43.3	4.4	10.0	1.3	5.2	32.4	6.8	0.0	4.8	37.3	48.8	0.0	51.3	0.0	283.9	13.0	144.9	439.0	152.4	736.3
15	1	S	L	S	H	0.0	0.0	0.0	0.0	0.0	12.2	0.0	13.8	38.2	130.8	0.0	93.4	2.0	19.4	64.1	0.0	0.0	0.0	144.2	151.1	0.0	0.0	0.0	33.6	0.0	361.7	328.9	12.2	702.8
16	1	S	L	N	H	99.2	0.0	0.0	0.0	0.0	41.2	0.0	5.2	61.0	40.4	1.2	15.1	0.0	0.0	0.0	0.0	0.0	4.7	0.0	60.3	0.0	33.7	0.0	25.5	8.2	122.9	132.3	140.5	395.7
17	2	S	L	S	H	78.1	0.0	0.0	0.0	0.0	0.0	0.0	4.5	36.2	20.5	6.2	32.9	0.0	2.9	76.4	0.0	0.0	22.1	76.0	22.2	0.0	88.2	0.0	148.4	0.0	179.6	356.8	78.1	614.5
18	2	C	H	N	L	0.0	22.0	2.7	0.0	0.0	30.8	0.0	1.4	10.4	31.7	25.7	17.2	0.0	178.5	0.0	0.0	0.0	0.0	212.5	29.0	0.0	54.2	0.0	188.1	88.8	264.9	572.6	55.5	893.0
19	2	S	H	S	H	28.0	1.4	0.0	0.0	0.0	50.8	0.0	3.6	65.5	116.2	3.3	6.8	0.0	3.3	29.3	3.2	0.0	0.0	380.8	32.8	0.0	88.4	0.0	176.4	0.0	231.1	678.4	80.1	989.6
20	2	C	L	N	H	28.9	0.0	2.7	0.0	0.0	0.0	0.0	6.9	30.3	0.0	117.6	4.2	0.0	24.1	2.1	0.0	0.0	0.0	6.7	7.6	0.0	0.0	0.0	424.0	51.8	185.1	490.1	31.5	706.7
21	2	S	H	N	H	37.9	1.1	0.0	0.0	0.0	62.1	0.0	3.5	63.5	22.2	6.1	15.6	1.3	4.5	9.3	0.0	0.0	11.2	96.9	20.5	0.0	89.4	0.0	343.2	0.0	125.9	561.1	101.0	788.1
22	2	S	L	N	H	104.3	0.0	0.0	0.0	0.0	1.1	0.0	3.9	69.5	71.5	1.4	51.2	0.0	1.7	0.0	0.0	0.0	29.8	1.9	55.1	0.0	42.2	0.0	209.7	0.0	199.1	338.7	105.4	643.2
23	2	S	H	S	L	13.4	0.0	0.0	0.0	0.0	58.6	0.0	5.6	95.1	48.6	6.0	23.7	2.5	4.5	30.1	0.0	0.0	25.0	78.9	8.7	0.0	47.7	0.0	257.0	0.0	216.1	417.3	71.9	705.4
24	2	C	H	N	H	49.8	35.7	2.1	0.0	0.0	22.1	1.4	1.2	35.1	36.0	11.4	9.3	0.0	39.0	7.3	0.0	0.0	10.2	106.2	7.5	0.0	32.2	0.0	38.2	30.5	139.4	224.9	111.0	475.3
25	2	C	L	S	H	72.4	3.3	0.0	0.0	0.0	0.0	0.0	2.1	9.5	18.7	106.7	1.6	0.0	61.1	16.2	1.7	0.0	2.3	31.1	0.0	0.0	87.4	0.0	126.7	17.1	217.6	264.6	75.7	557.9
26	2	C	L	S	L	91.1	17.3	37.5	0.0	0.0	0.0	0.0	1.5	48.3	78.5	39.5	3.7	0.0	59.8	12.5	0.0	0.0	26.1	16.8	34.8	0.0	0.0	0.0	81.3	51.2	243.7	210.1	145.9	599.7
27	2	S	H	N	L	45.0	22.7	0.0	0.0	0.0	35.1	0.0	5.1	74.7	108.4	0.0	34.8	1.3	2.6	6.7	2.4	0.0	36.6	35.6	2.9	0.0	50.1	0.0	250.1	0.0	235.9	375.3	102.8	714.1
28	2	C	H	S	L	6.2	0.0	48.4	0.0	0.0	27.2	125.3	4.1	50.2	60.7	122.0	17.2	1.3	34.6	9.2	1.7	0.0	9.9	187.4	6.1	0.0	55.4	0.0	111.8	104.0	301.0	474.6	207.1	982.7
29	2	C	H	S	H	6.5	66.7	1.0	0.0	0.0	7.5	228.2	7.3	14.4	2.8	37.3	1.4	0.3	28.6	69.2	0.0	0.0	3.6	67.6	3.0	0.0	75.1	0.0	267.4	175.6	161.2	592.4	309.8	1063.5
30	2	S	L	S	L	45.1	0.0	0.0	0.0	0.0	5.1	0.0	8.8	26.9	91.0	0.9	3.0	0.0	2.5	5.3	1.5	0.0	1.7	60.4	11.0	0.0	11.8	0.0	184.8	0.0	140.0	269.8	50.1	459.9
31	2	C	L	N	L	73.2	5.1	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0	39.8	1.6	0.0	57.1	0.0	0.0	0.0	6.5	0.0	3.1	0.0	0.0	0.0	27.1	0.0	104.7	36.7	78.4	219.7
32	2	S	L	N	L	235.5	0.0	0.0	0.0	0.0	0.0	0.0	1.6	82.5	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	70.0	0.0	105.6	0.0	26.1	0.0	88.5	201.7	235.5	525.7
33	3	C	L	S	L	12.0	1.2	0.0	0.0	0.0	0.0	0.0	2.1	9.1	21.3	104.5	0.0	0.0	29.4	2.6	0.0	0.0	0.0	0.0	0.0	0.0	2.2	0.0	31.0	12.5	169.0	45.7	13.2	227.9
34	3	S	L	N	L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	62.4	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	17.0	0.0	0.0	0.0	5.8	4.8	78.2	27.6	0.0	105.9
35	3	C	L	N	L	14.4	0.7	0.0	0.0	0.0	0.0	0.0	5.1	4.1	5.4	80.9	0.5	0.0	38.4	0.5	0.0	0.0	0.0	4.1	17.2	0.0	0.0	0.0	122.3	58.0	134.9	201.6	15.1	351.5
36	3	S	L	S	L	37.5	0.0	0.0	0.0	0.0	0.0	0.0	9.0	54.2	0.0	0.0	0.0	0.0	1.1	17.1	0.0	0.0	0.0	28.4	48.9	0.0	0.0	0.0	206.0	0.0	81.5	283.3	37.5	402.3
37	3	S	H	S	L	13.4	0.0	0.0	0.0	0.0	20.1	0.9	18.9	18.6	78.0	1.9	3.9	0.0	0.8	46.4	0.0	0.0	14.6	69.0	11.4	0.0	18.2	0.0	97.1	0.0	168.6	210.2	34.4	413.1
38	3	C	H	S	L	20.8	3.0	11.6	0.0	0.0	9.9	7.8	0.0	6.7	22.3	47.9	5.6	0.0	21.3	10.7	0.0	0.0	3.8	16.8	17.7	0.0	3.6	0.0	49.6	58.6	114.6	150.0	53.0	317.6
39	3	S	H	N	L	162.6	0.0	0.0	0.0	0.0	0.0	0.0	5.4	59.1	9.6	0.0	13.4	0.0	1.8	21.5	1.2	0.0	21.2	25.3	28.8	0.0	23.2	0.0	184.1	0.0	111.9	282.6	162.6	557.2
40	3	S	L	N	H	57.5	0.0	0.0	0.0	0.0	0.0	0.0	2.9	106.4	0.0	0.0	28.2	0.0	0.0	0.0	0.0	0.0	47.0	17.9	100.9	0.0	21.4	0.0	77.0	0.0	137.6	264.1	57.5	459.2

Number	Block	Species set	Groundwater level	Stratification	Seeding density	*Calamagrostis canadensis*	*Glyceria striata*	*Leersia oryzoides*	*Sparganium eurycarpum*	*Eleocharis palustris*	*Juncus dudleyi*	*Scirpus tabernaemontani*	*Asclepias incarnata*	*Aster puniceus*	*Eupatorium perfoliatum*	*Helenium autumnale*	*Lobelia siphilitica*	*Scutellaria lateriflora*	*Solidago gigantea*	*Cicuta maculata*	*Stachys palustris*	*Thalictrum dasycarpum*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex pellita*	*Carex stipata*	*Carex stricta*	*Carex tribuloides*	*Carex vulpinoidea*	Forbs	Sedges	Grasses	Total
41	3	S	H	N	H	0.0	1.0	0.0	0.0	0.0	30.4	0.0	14.8	18.9	0.0	29.0	4.3	0.9	32.1	18.2	0.0	0.0	20.5	13.1	10.4	0.0	1.8	0.0	194.3	0.0	118.2	240.2	31.3	389.8
42	3	C	H	S	H	15.5	19.4	65.4	0.0	0.0	67.1	130.4	1.4	42.0	14.2	20.6	11.9	0.6	48.0	49.9	2.0	0.0	7.0	26.2	1.4	0.0	44.2	0.0	37.3	24.7	190.8	140.9	297.7	629.4
43	3	S	H	S	H	25.4	1.8	1.1	0.0	0.0	75.8	0.0	5.3	67.1	2.8	1.0	5.9	2.6	12.1	25.0	0.0	0.0	8.7	62.3	32.6	0.0	62.0	0.0	144.4	4.3	121.8	314.1	104.1	540.0
44	3	C	L	N	H	44.2	5.6	3.8	0.0	0.0	19.1	0.0	2.1	23.6	1.5	16.8	28.1	0.0	106.3	1.3	0.0	0.0	0.0	20.7	21.7	0.0	8.5	0.0	132.4	35.1	179.7	218.3	72.6	470.5
45	3	C	H	N	H	52.5	14.7	4.2	0.0	0.0	46.5	0.0	6.7	12.9	6.0	24.1	1.8	0.9	13.3	33.6	0.0	0.0	15.7	107.8	11.9	0.0	65.3	0.0	48.9	38.2	99.4	287.7	117.9	504.9
46	3	S	L	S	H	65.1	0.0	0.0	0.0	0.0	0.0	0.0	3.4	47.0	74.5	4.0	5.1	0.0	2.1	22.5	2.2	0.0	34.3	42.5	13.4	0.0	72.2	0.0	128.0	0.0	160.8	290.4	65.1	516.3
47	3	C	H	N	L	0.0	100.4	3.2	0.0	0.0	21.9	0.0	6.0	12.0	15.4	18.6	7.1	0.7	24.3	2.0	0.5	0.0	0.0	24.5	2.2	0.0	66.5	0.0	32.4	95.9	86.7	221.6	125.5	433.7
48	3	C	L	S	H	1.1	0.0	1.2	0.0	0.0	0.0	0.0	3.7	67.9	8.3	20.0	6.8	0.0	52.4	6.6	0.0	0.0	5.5	55.4	4.2	0.0	37.9	0.0	10.4	24.5	165.7	137.8	2.3	305.9
49	4	S	L	S	L	32.5	0.0	0.0	0.0	0.0	10.1	0.0	1.5	48.1	93.8	0.0	6.1	0.0	2.1	11.9	0.0	0.0	0.0	74.9	51.0	0.0	5.3	0.0	34.1	0.0	163.4	165.3	42.6	371.3
50	4	S	H	N	L	84.6	0.0	0.0	0.0	0.0	10.8	0.0	1.3	62.4	56.3	0.0	1.5	0.0	1.2	0.0	0.0	0.0	1.1	80.9	76.2	0.0	62.8	0.0	115.5	0.0	122.7	336.5	95.3	554.5
51	4	S	L	N	L	164.5	0.0	0.0	0.0	0.0	12.7	0.0	0.0	62.8	0.0	0.0	12.5	0.0	6.5	0.0	0.0	0.0	0.0	13.1	158.6	0.0	7.6	0.0	104.7	0.0	81.8	283.9	177.1	542.8
52	4	C	H	S	L	70.4	145.6	70.0	0.0	0.0	26.9	0.0	5.2	109.5	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	114.4	0.0	119.8	114.4	312.9	547.0
53	4	C	L	N	H	16.3	2.2	0.0	0.0	0.0	4.6	0.0	38.6	0.0	13.5	135.0	5.2	0.0	48.5	0.0	0.0	0.0	0.0	1.7	9.5	0.0	5.8	0.0	43.4	30.1	240.8	90.5	23.1	354.3
54	4	S	H	S	H	62.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	61.0	64.2	1.6	15.3	0.0	0.0	48.3	0.0	0.0	67.0	55.0	23.9	0.0	66.3	0.0	370.2	0.0	190.3	582.4	62.0	834.7
55	4	C	H	N	H	54.6	19.4	0.0	0.0	0.0	25.5	0.0	1.5	19.7	44.5	22.3	17.7	0.0	29.1	5.1	0.0	0.0	3.3	27.2	14.1	0.0	0.0	0.0	55.2	23.3	139.9	123.1	99.4	362.4
56	4	C	L	N	L	72.1	1.7	2.0	0.0	0.0	27.4	0.0	0.0	0.6	6.0	50.8	9.8	0.0	48.6	1.0	0.0	0.0	16.5	41.4	1.0	0.0	8.3	0.0	121.9	56.5	116.6	245.6	103.2	465.4
57	4	S	L	N	H	210.8	0.0	0.0	0.0	0.0	1.8	0.0	8.5	45.5	25.6	18.5	0.0	0.0	0.0	0.0	0.0	0.0	45.9	0.0	1.6	0.0	25.3	0.0	111.8	0.0	98.2	184.5	212.5	495.2
58	4	S	L	S	H	35.7	0.0	0.0	0.0	0.0	3.3	0.0	10.6	44.5	141.7	1.9	30.4	0.0	7.3	6.9	1.9	0.0	44.2	26.4	19.0	0.0	66.6	0.0	251.7	0.0	245.2	407.8	39.0	692.0
59	4	C	L	S	L	25.7	17.7	1.7	0.0	0.0	0.0	13.0	2.9	42.2	11.7	96.7	20.0	0.0	13.3	2.4	0.0	0.0	3.9	23.2	25.3	0.0	828.5	0.0	111.6	45.1	189.2	1037.5	58.2	1284.9
60	4	S	H	N	H	158.6	0.0	0.0	0.0	0.0	3.2	0.0	8.7	12.5	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.6	134.7	71.0	0.0	6.3	0.0	231.7	0.0	25.3	496.4	161.9	683.5
61	4	C	H	N	L	14.7	2.8	0.0	0.0	0.0	17.5	113.9	1.7	3.7	20.4	166.2	6.0	0.0	19.7	6.1	0.0	0.0	0.0	162.4	4.2	0.0	5.7	0.0	59.0	26.4	223.8	257.7	148.9	630.4
62	4	C	H	S	H	7.5	2.7	0.0	0.0	0.0	9.8	89.1	1.1	7.8	29.5	98.6	3.0	0.0	14.3	6.3	0.0	0.0	1.5	59.0	0.0	0.0	5.3	0.0	27.8	12.5	160.5	106.2	109.1	375.8
63	4	S	H	S	L	10.1	0.0	0.0	0.0	0.0	30.0	0.0	6.7	20.3	109.1	3.2	12.3	1.6	4.2	63.7	2.2	0.0	11.6	330.0	24.3	0.0	110.5	0.0	141.6	0.0	223.3	618.1	40.1	881.5
64	4	C	L	S	H	12.0	10.9	12.0	0.0	0.0	14.7	0.0	3.3	66.1	43.9	31.0	41.2	0.0	40.5	3.1	0.0	0.0	13.7	100.2	19.9	0.0	16.6	0.0	95.7	47.3	229.1	293.4	49.6	572.1
65	5	S	L	N	L	44.3	0.0	0.0	0.0	0.0	2.4	0.0	4.9	166.9	26.9	0.0	28.5	0.0	4.0	0.0	0.0	0.0	50.5	0.0	86.2	0.0	79.5	0.0	130.2	0.0	231.2	346.4	46.7	624.3
66	5	S	H	S	H	43.6	0.0	6.4	0.0	0.0	17.6	0.0	3.5	29.0	64.3	0.2	8.6	0.0	0.0	22.2	0.0	0.0	2.0	151.0	11.1	0.0	73.2	0.0	96.4	0.0	127.7	333.8	67.6	529.1
67	5	S	L	N	H	23.1	0.0	0.0	0.0	0.0	1.9	0.0	1.4	136.4	22.3	0.0	40.0	0.0	0.9	0.4	0.0	0.0	4.8	47.2	50.2	0.0	17.1	0.0	138.8	0.0	201.4	258.0	25.0	484.5
68	5	C	H	S	H	27.9	8.0	13.2	0.0	0.0	28.1	125.2	10.4	12.5	31.3	86.1	4.7	0.0	27.0	29.0	0.8	0.0	1.8	84.3	16.9	0.0	4.5	0.0	62.5	2.7	201.9	172.7	202.5	577.0
69	5	S	H	S	L	94.0	0.0	0.0	0.0	0.0	9.5	0.0	25.1	16.2	23.3	2.2	8.3	0.0	3.6	27.8	0.0	0.0	3.6	3.9	18.3	0.0	28.6	0.0	158.3	0.0	106.4	212.7	103.5	422.6
70	5	S	H	N	H	43.5	0.0	0.0	0.0	0.0	9.7	0.0	2.7	48.6	34.2	0.0	8.8	0.0	1.1	2.5	0.0	0.0	1.6	6.6	9.2	0.0	8.2	0.0	33.0	0.0	97.9	58.5	53.3	209.7
71	5	C	H	N	L	3.7	47.6	0.0	0.0	0.0	9.0	0.0	17.6	18.5	81.6	0.0	1.8	0.0	16.4	0.0	2.1	0.0	2.4	7.4	10.5	0.0	57.7	0.0	21.1	10.7	138.1	109.9	60.3	308.2
72	5	S	L	S	H	7.9	0.0	0.0	0.0	0.0	0.0	0.0	7.0	65.3	109.8	0.0	8.0	0.0	0.0	4.1	0.0	0.0	1.6	14.8	21.9	0.0	6.1	0.0	79.3	0.0	194.1	123.7	7.9	325.7
73	5	C	L	N	H	23.7	9.7	0.8	0.0	0.0	8.3	0.0	1.7	18.6	23.3	20.5	13.1	0.0	87.8	4.1	0.0	0.0	8.4	28.4	14.6	0.0	24.0	0.0	98.2	42.4	169.0	216.0	42.5	427.5
74	5	C	H	S	L	23.3	21.5	71.0	0.0	0.0	7.2	246.0	12.0	29.3	4.9	10.0	4.8	3.1	21.6	13.7	0.0	0.0	7.6	0.0	3.4	0.0	57.8	0.0	32.3	26.4	99.3	127.6	369.0	595.8
75	5	C	L	S	L	0.0	5.1	3.4	0.0	0.0	0.0	0.0	5.3	51.3	60.3	80.9	1.9	0.0	100.9	8.9	0.0	0.0	2.4	29.6	30.6	0.0	16.5	0.0	73.6	39.8	309.5	192.5	8.5	510.5
76	5	S	H	N	L	68.2	0.0	1.2	0.0	0.0	63.8	0.0	8.9	34.5	45.5	0.0	36.9	0.5	10.5	0.0	0.0	0.0	0.0	164.6	21.1	0.0	174.8	0.0	60.1	0.0	136.9	420.6	133.1	690.6
77	5	C	H	N	H	0.0	31.8	0.0	0.0	0.0	34.2	0.0	1.3	4.4	41.5	28.5	7.1	0.0	15.8	0.0	0.0	0.0	0.0	61.3	2.7	0.0	5.9	0.0	44.9	21.9	98.7	136.7	66.0	301.4
78	5	S	L	S	L	2.6	0.0	0.0	0.0	0.0	24.1	0.0	4.3	36.0	92.9	12.8	37.5	0.0	0.6	13.9	0.0	0.0	0.7	52.6	33.0	0.0	26.2	0.0	164.8	12.7	198.0	290.1	26.7	514.8
79	5	C	L	S	H	3.0	14.0	0.0	0.0	0.0	7.3	8.1	0.0	6.1	92.8	19.9	0.9	0.0	38.4	9.0	0.7	0.0	1.4	51.0	11.7	0.0	17.7	0.0	122.5	20.0	167.8	224.2	32.4	424.5
80	5	C	L	N	L	18.4	9.0	0.0	0.0	0.0	14.8	0.0	0.0	30.0	43.8	0.0	46.2	0.0	33.0	1.4	0.0	0.0	0.0	0.0	48.3	0.0	11.0	0.0	61.5	40.4	154.4	161.2	42.1	357.7

Study Two

Count Data

Unit	Year	Block	Groundwater Level	Seeding Date	*Asclepias incarnata*	*Aster puniceus*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex stipata*	*Carex tribuloides*	*Carex vulpinoidea*	*Cicuta maculata*	*Eupatorium perfoliatum*	*Glyceria striata*	*Helenium autumnale*	*Juncus dudleyi*	*Calamagrostis canadensis*	*Lobelia siphilitica*	*Scirpus tabernaemontani*	*Scutellaria lateriflora*	*Solidago gigantea*	*Stachys palustris*	Forbs	Sedges	Grasses	Total	Simpson Diversity
1	1	1	5	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	1	5	11	0	0	2	0	0	0	6	11	14	31	3.5
2	1	1	10	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	2	0	0	7	2	0	0	4	0	0	0	10	2	6	18	4.2
3	1	1	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	5	0	0	5	0	0	0	0	2	10	12	2.7
4	1	1	10	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	2	0	1	5	10	0	0	2	0	0	0	7	5	13	25	3.9
5	1	1	20	1	0	2	n/a	n/a	n/a	n/a	n/a	n/a	1	0	2	6	4	0	0	2	1	1	0	11	9	8	28	5.3
6	1	1	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	1	2	6	0	0	4	0	0	0	2	8	11	21	3.6
7	1	1	5	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	2	0	1	4	5	0	0	3	0	0	0	6	11	9	26	3.8
8	1	1	5	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	3	0	0	3	0	0	0	0	4	6	10	2.9
9	1	1	20	3	2	1	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	0	2	0	0	3	0	0	0	4	8	5	17	3.5
10	1	1	0	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	2	0	0	4	0	0	0	0	11	6	17	2.0
11	1	1	10	3	2	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	2	0	0	2	0	0	0	2	6	4	12	3.0
12	1	1	20	2	5	4	n/a	n/a	n/a	n/a	n/a	n/a	2	0	1	6	1	0	0	1	3	5	0	25	8	3	36	7.1
13	1	2	0	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0	0	0	4	0	0	0	0	1	4	5	1.5
14	1	2	5	3	1	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	3	0	0	0	0	4	0	0	0	2	2	7	11	3.9
15	1	2	10	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	4	5	0	0	6	0	0	0	5	10	11	26	3.8
16	1	2	20	3	2	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	1	7	4	0	0	5	0	1	0	10	13	10	33	4.1
17	1	2	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	0	4	0	0	4	0	0	0	1	2	8	11	3.3
18	1	2	20	2	4	1	n/a	n/a	n/a	n/a	n/a	n/a	3	0	0	5	1	0	0	3	0	0	0	13	12	4	29	4.1
19	1	2	5	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	2	0	0	1	1	0	0	3	0	0	0	3	12	4	19	2.3
20	1	2	10	1	1	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	4	3	0	0	3	2	0	0	7	10	6	23	3.8
21	1	2	5	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	3	0	0	2	4	0	0	4	0	0	0	5	8	8	21	4.0
22	1	2	20	1	2	7	n/a	n/a	n/a	n/a	n/a	n/a	2	0	0	3	3	0	0	2	5	1	0	20	11	5	36	5.7
23	1	2	10	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	3	0	0	1	3	0	0	3	3	4	10	3.6
24	1	2	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	1	0	7	0	0	1	4	0	0	4	7	9	20	3.4
25	1	3	10	1	0	1	n/a	n/a	n/a	n/a	n/a	n/a	4	0	0	2	3	0	0	2	0	0	0	7	9	5	21	3.8
26	1	3	5	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	2	0	0	4	0	0	0	0	4	6	10	2.8
27	1	3	5	2	3	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	1	1	0	0	0	4	0	0	0	4	9	5	18	3.0
28	1	3	0	2	3	0	n/a	n/a	n/a	n/a	n/a	n/a	2	0	0	1	1	0	0	4	0	0	0	6	11	5	22	3.2
29	1	3	5	1	1	3	n/a	n/a	n/a	n/a	n/a	n/a	1	0	2	2	4	0	0	3	1	0	0	8	14	9	31	4.0
30	1	3	0	1	1	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	1	1	6	0	0	3	0	0	0	2	8	10	20	3.6
31	1	3	20	1	2	11	n/a	n/a	n/a	n/a	n/a	n/a	2	0	1	4	1	0	0	3	1	0	0	20	11	5	36	4.7

Unit	Year	Block	Groundwater Level	Seeding Date	*Asclepias incarnata*	*Aster puniceus*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex stipata*	*Carex tribuloides*	*Carex vulpinoidea*	*Cicuta maculata*	*Eupatorium perfoliatum*	*Glyceria striata*	*Helenium autumnale*	*Juncus dudleyi*	*Calamagrostis canadensis*	*Lobelia siphilitica*	*Scirpus tabernaemontani*	*Scutellaria lateriflora*	*Solidago gigantea*	*Stachys palustris*	Forbs	Sedges	Grasses	Total	Simpson Diversity
32	1	3	10	3	1	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	3	0	0	4	0	0	0	1	6	7	14	3.2
33	1	3	20	2	2	1	n/a	n/a	n/a	n/a	n/a	n/a	2	0	1	7	3	0	0	1	3	3	0	18	11	5	34	5.6
34	1	3	0	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	1	0	0	5	0	0	0	0	2	6	8	2.1
35	1	3	20	3	4	2	n/a	n/a	n/a	n/a	n/a	n/a	3	0	0	3	0	0	0	3	0	3	0	15	9	3	27	5.3
36	1	3	10	2	1	0	n/a	n/a	n/a	n/a	n/a	n/a	2	0	0	3	7	0	0	4	0	0	0	6	15	11	32	3.4
37	1	4	10	2	3	0	n/a	n/a	n/a	n/a	n/a	n/a	3	0	0	3	2	0	0	3	0	0	0	9	11	5	25	3.9
38	1	4	20	3	3	1	n/a	n/a	n/a	n/a	n/a	n/a	2	0	0	1	6	0	0	4	0	1	0	8	10	10	28	4.7
39	1	4	0	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	1	0	3	0	0	4	0	0	0	0	8	8	16	2.8
40	1	4	20	2	2	4	n/a	n/a	n/a	n/a	n/a	n/a	2	0	3	6	3	0	0	3	5	3	0	22	9	9	40	7.9
41	1	4	5	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	1	6	0	0	4	0	0	0	2	11	10	23	3.0
42	1	4	20	1	2	0	n/a	n/a	n/a	n/a	n/a	n/a	4	0	0	2	3	0	0	3	1	3	0	12	12	6	30	4.6
43	1	4	5	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	3	4	0	0	5	0	0	0	4	11	9	24	3.3
44	1	4	10	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	2	4	0	0	5	0	0	0	3	6	9	18	4.0
45	1	4	5	3	1	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	6	0	0	2	0	0	0	1	6	8	15	2.9
46	1	4	10	1	1	2	n/a	n/a	n/a	n/a	n/a	n/a	0	0	3	1	6	0	0	2	0	0	0	4	9	11	24	4.2
47	1	4	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	1	0	4	0	0	1	0	0	0	0	9	6	15	2.3
48	1	4	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	3	0	0	2	0	0	0	0	9	5	14	2.1
49	1	5	0	2	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	1	0	1	0	0	5	0	0	0	0	9	7	16	2.4
50	1	5	20	3	4	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	2	1	0	0	4	0	1	0	8	8	5	21	4.3
51	1	5	20	2	1	2	n/a	n/a	n/a	n/a	n/a	n/a	1	0	1	8	0	0	0	3	2	1	0	15	16	4	35	3.6
52	1	5	5	3	1	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	1	0	0	3	0	0	0	1	7	4	12	2.4
53	1	5	20	1	0	1	n/a	n/a	n/a	n/a	n/a	n/a	2	0	2	5	3	0	0	2	5	4	0	19	13	7	39	5.8
54	1	5	10	1	1	0	n/a	n/a	n/a	n/a	n/a	n/a	2	0	1	2	2	0	0	4	3	4	0	12	9	7	28	5.8
55	1	5	0	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	3	0	0	4	0	0	0	0	3	7	10	2.9
56	1	5	5	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	3	0	0	0	5	0	0	3	1	1	0	5	8	8	21	4.0
57	1	5	0	1	0	0	n/a	n/a	n/a	n/a	n/a	n/a	1	0	0	0	2	0	0	4	0	0	0	1	4	6	11	3.3
58	1	5	5	2	1	0	n/a	n/a	n/a	n/a	n/a	n/a	2	0	1	1	7	0	0	4	0	2	0	6	13	12	31	3.9
59	1	5	10	3	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	4	0	0	7	0	0	0	0	5	11	16	2.8
60	1	5	10	2	0	1	n/a	n/a	n/a	n/a	n/a	n/a	1	0	1	5	2	0	0	2	2	2	0	11	9	5	25	5.0
1	2	1	5	2	2	0	4	3	1	0	2	2	1	0	1	3	11	0	0	6	0	1	0	7	12	18	37	6.6
2	2	1	10	1	1	5	1	0	0	0	0	3	2	0	0	2	2	0	0	12	0	1	0	11	4	14	29	4.4
3	2	1	0	2	1	0	4	0	2	0	0	1	0	0	0	1	8	0	0	11	0	0	0	2	7	19	28	3.8
4	2	1	10	2	1	2	5	1	1	0	0	2	4	0	2	4	7	0	0	7	0	2	0	13	9	16	38	8.3
5	2	1	20	1	1	4	5	1	1	2	1	5	2	0	1	5	3	0	0	4	2	4	0	18	15	8	41	11.3
6	2	1	0	1	0	0	2	1	0	0	0	2	0	0	1	5	5	0	0	10	0	0	0	5	5	16	26	4.2

Unit	Year	Block	Groundwater Level	Seeding Date	*Asclepias incarnata*	*Aster puniceus*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex stipata*	*Carex tribuloides*	*Carex vulpinoidea*	*Cicuta maculata*	*Eupatorium perfoliatum*	*Glyceria striata*	*Helenium autumnale*	*Juncus dudleyi*	*Calamagrostis canadensis*	*Lobelia siphilitica*	*Scirpus tabernaemontani*	*Scutellaria lateriflora*	*Solidago gigantea*	*Stachys palustris*	Forbs	Sedges	Grasses	Total	Simpson Diversity
7	2	1	5	1	0	1	7	1	0	1	1	4	3	0	1	7	3	0	0	7	0	0	0	11	14	11	36	7.0
8	2	1	5	3	0	0	4	2	0	0	1	1	1	1	0	1	1	0	0	5	0	0	0	3	8	6	17	5.7
9	2	1	20	3	6	0	4	1	0	1	0	2	1	0	0	1	4	1	0	3	1	2	0	11	8	8	27	8.0
10	2	1	0	3	2	0	5	3	0	1	0	1	0	0	0	1	3	0	0	7	0	0	0	3	10	10	23	5.3
11	2	1	10	3	2	0	1	2	0	1	0	1	1	0	0	0	2	0	0	7	0	0	0	3	5	9	17	4.4
12	2	1	20	2	4	4	3	0	0	2	0	4	0	0	1	5	0	0	0	4	2	9	0	24	9	5	38	7.7
13	2	2	0	3	0	1	8	0	0	0	0	2	2	0	0	0	2	0	0	7	0	0	0	3	10	9	22	3.8
14	2	2	5	3	1	0	4	0	0	1	0	1	2	0	3	1	0	0	0	10	0	0	0	4	6	13	23	4.0
15	2	2	10	2	5	3	5	1	0	1	0	4	2	0	0	3	5	0	0	11	0	1	0	14	11	16	41	7.1
16	2	2	20	3	3	5	7	2	0	1	0	3	1	0	2	2	3	0	0	8	0	7	0	18	13	13	44	8.5
17	2	2	0	1	0	0	2	1	0	0	0	1	1	0	0	2	5	1	0	12	0	0	0	3	4	18	25	3.5
18	2	2	20	2	6	4	8	1	0	0	0	5	2	0	0	3	3	0	0	6	0	1	0	16	14	9	39	7.6
19	2	2	5	2	7	2	6	3	0	2	0	3	3	0	1	2	2	0	0	8	2	2	0	18	14	11	43	9.2
20	2	2	10	1	1	2	5	2	0	0	1	1	2	0	0	5	1	0	0	6	1	3	0	14	9	7	30	8.0
21	2	2	5	1	1	1	6	2	0	0	0	3	3	0	0	2	2	0	0	8	0	2	0	9	11	10	30	6.6
22	2	2	20	1	2	1	5	1	0	2	0	4	3	0	0	3	2	0	0	4	1	1	0	11	12	6	29	9.2
23	2	2	10	3	0	0	4	0	1	1	0	0	2	0	2	1	3	0	0	9	0	0	0	3	6	14	23	4.5
24	2	2	0	2	1	0	2	2	0	0	0	4	0	0	1	3	8	0	0	4	0	0	0	4	8	13	25	5.4
25	2	2	10	1	0	0	9	2	0	0	0	2	2	1	0	4	1	0	0	7	0	1	0	8	13	8	29	5.2
26	2	3	5	3	3	0	3	0	0	0	0	3	1	0	0	2	2	0	0	9	0	0	0	6	6	11	23	4.5
27	2	3	5	2	4	0	8	2	0	0	0	2	1	0	2	3	2	0	0	7	0	0	0	8	12	11	31	6.2
28	2	3	0	2	3	0	5	1	2	0	0	1	2	0	0	3	0	0	0	8	0	0	0	8	9	8	25	5.3
29	2	3	5	1	1	1	6	2	0	0	0	2	2	0	0	2	5	0	0	6	0	3	0	9	10	11	30	7.3
30	2	3	0	1	3	1	2	3	0	0	0	0	0	0	0	2	7	0	0	9	0	3	0	9	5	16	30	5.4
31	2	3	20	1	2	0	4	1	1	0	0	4	3	0	1	5	4	0	0	5	1	9	0	20	10	10	40	8.2
32	2	3	10	3	1	1	4	0	0	0	0	1	4	0	0	1	5	0	0	10	0	3	0	10	5	15	30	5.3
33	2	3	20	2	2	2	3	1	2	2	0	2	2	0	1	7	4	0	0	4	0	7	0	20	10	9	39	9.2
34	2	3	0	3	1	0	0	2	0	0	0	0	5	0	0	0	2	0	0	12	0	1	0	7	2	14	23	3.0
35	2	3	20	3	0	0	5	3	0	1	0	2	1	0	0	5	1	0	0	7	2	4	0	12	11	8	31	7.1
36	2	3	10	2	3	1	3	3	1	1	1	0	2	0	1	4	4	0	0	0	0	2	0	12	9	5	26	9.4
37	2	3	10	2	1	1	5	2	2	2	0	0	5	0	0	4	1	0	0	8	0	2	0	13	11	9	33	7.3
38	2	4	20	3	3	1	2	1	2	1	1	1	1	0	1	2	6	0	0	6	1	8	0	16	8	13	37	8.3
39	2	4	0	3	0	0	4	1	1	1	0	0	0	0	1	0	6	0	0	8	0	0	0	0	7	15	22	4.0
40	2	4	20	2	2	4	4	1	1	0	1	0	4	0	2	3	3	0	0	3	2	7	0	22	7	8	37	9.8
41	2	4	5	2	3	0	1	1	1	0	0	0	0	0	0	2	5	0	0	10	0	2	0	7	3	15	25	4.3

Unit	Year	Block	Groundwater Level	Seeding Date	*Asclepias incarnata*	*Aster puniceus*	*Carex cristatella*	*Carex hystericina*	*Carex molesta*	*Carex stipata*	*Carex tribuloides*	*Carex vulpinoidea*	*Cicuta maculata*	*Eupatorium perfoliatum*	*Glyceria striata*	*Helenium autumnale*	*Juncus dudleyi*	*Calamagrostis canadensis*	*Lobelia siphilitica*	*Scirpus tabernaemontani*	*Scutellaria lateriflora*	*Solidago gigantea*	*Stachys palustris*	Forbs	Sedges	Grasses	Total	Simpson Diversity
42	2	4	20	1	1	0	3	1	3	2	0	2	4	0	0	4	4	1	0	5	0	5	0	14	11	10	35	9.6
43	2	4	5	1	0	0	5	0	0	0	2	2	3	0	1	3	4	0	0	7	0	3	0	9	9	12	30	7.1
44	2	4	10	3	0	1	3	0	1	1	1	1	1	0	0	5	5	0	0	9	0	2	0	9	7	14	30	6.0
45	2	4	5	3	1	1	5	0	0	1	0	0	1	0	0	0	8	0	0	5	0	1	0	4	6	13	23	4.4
46	2	4	10	1	0	0	5	2	1	2	0	5	0	0	2	2	3	0	0	5	0	1	0	3	15	10	28	7.7
47	2	4	0	1	2	0	3	4	0	2	0	1	0	0	0	0	4	0	0	5	0	0	0	2	10	9	21	5.9
48	2	4	0	2	1	0	5	0	2	1	0	0	0	0	0	1	4	0	0	8	0	1	0	3	8	12	23	4.7
49	2	4	0	2	0	1	5	2	2	0	2	0	1	0	1	3	2	0	0	6	0	0	0	5	11	9	25	7.0
50	2	5	20	3	4	1	3	3	1	2	0	1	1	0	0	2	1	0	0	4	3	4	0	15	10	5	30	10.2
51	2	5	20	2	0	1	2	3	0	0	1	3	1	0	1	6	2	1	0	3	1	4	0	13	9	7	29	9.0
52	2	5	5	3	0	1	6	1	0	0	0	1	1	0	0	1	1	0	0	6	0	1	0	4	8	7	19	4.6
53	2	5	20	1	0	1	2	3	0	1	0	4	2	0	1	5	2	0	0	3	3	5	0	16	10	6	32	9.5
54	2	5	10	1	1	1	3	1	0	0	0	1	2	0	0	2	1	0	0	11	1	5	0	12	5	12	29	5.0
55	2	5	0	3	0	1	1	0	1	1	0	0	1	0	0	0	4	0	0	7	0	0	0	2	3	11	16	3.7
56	2	5	5	1	0	0	2	5	0	1	0	0	3	0	0	0	6	0	0	8	3	1	0	7	8	14	29	5.6
57	2	5	0	1	1	0	1	1	1	0	1	1	3	0	0	0	3	0	0	0	0	0	0	4	5	3	12	6.0
58	2	5	5	2	1	1	2	1	0	1	1	3	4	0	0	2	6	0	0	7	2	2	0	12	8	13	33	8.3
59	2	5	10	3	0	0	3	1	0	1	0	1	3	0	0	2	2	1	0	8	0	1	0	6	6	11	23	5.6
60	2	5	10	2	0	3	3	0	1	0	1	2	1	0	1	6	3	0	0	8	1	4	0	15	7	12	34	7.6

APPENDIX D: DIAGRAMS

This section outlines several diagrams and pictures of the experimental layout of the second study presented in Chapter III.

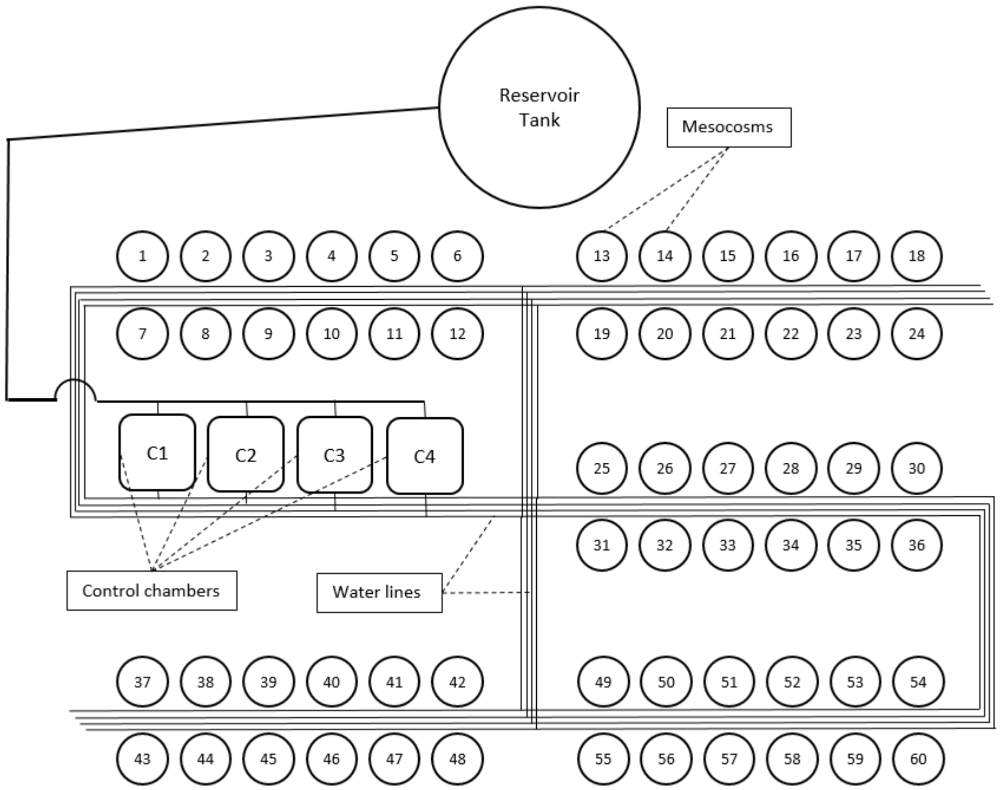

Figure E1. – Diagram of the water-control system. The mesocosm number corresponds to the raw data. Each grouping of 12 mesocosms was a different block. The four water lines remained completely separate from one another. Each mesocosm was connected to one of the four water lines depending on its assigned groundwater level, i.e., mesocosm 3 was connected to the 0 cm water line, which was connected to control chamber C4.

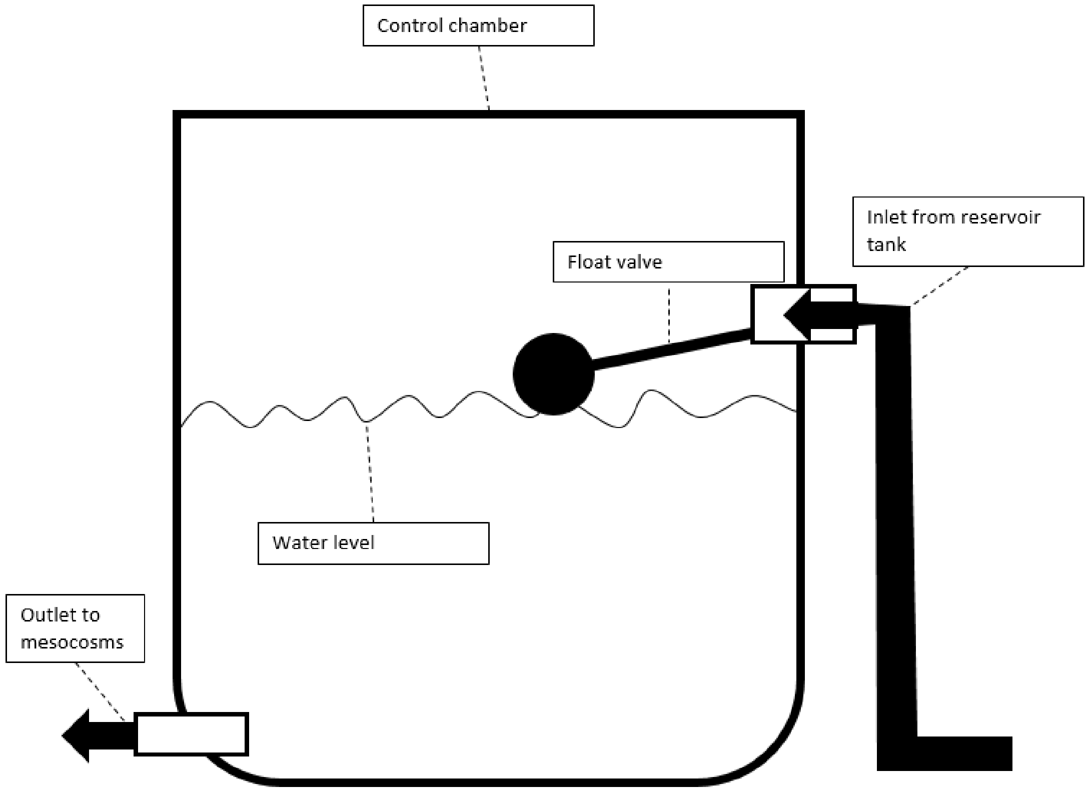

Figure E2. – Diagram of a control chamber. Water enters the chamber from the reservoir tank at the inlet. Once the float valve is raised to a set water level, the valve is automatically closed. As the chamber is filling with water, water exits through the outlet and flows into the mesocosms.

Figure E3. – Photo of the piping for the water control system.

Figure E4. – Photo of the control chambers during the experiment.

Figure E5. – Photo of a few of the mesocosms during the experiment